



Vital Signs: Core Metrics for Health and Health Care Progress

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VITAL SIGNS

CORE METRICS

FOR HEALTH AND HEALTH CARE PROGRESS

Committee on Core Metrics for Better Health at Lower Cost

David Blumenthal, Elizabeth Malphrus, and J. Michael McGinnis, *Editors*

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Willing is not enough; we must do.”*

—Goethe



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This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the National Research Council's Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We wish to thank the following individuals for their review of this report:

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Although the reviewers listed above provided many constructive comments and suggestions, they were not asked to endorse the report's conclusions or recommendations, nor did they see the final draft of the report before its release. The review of this report was overseen by coordinator **Eric B. Larson**, Group Health Research Institute, and monitor **Donald M. Steinwachs**, Bloomberg School of Public Health, Johns Hopkins University. Appointed by the National Research Council and the Institute of Medicine, they were responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authoring committee and the institution.

Preface

In the enormously complex U.S. health care system, even progress often creates problems. After years of debate over whether and how to measure the health system's performance, consensus now holds that measuring performance is essential to performance improvement. This consensus, however, has unleashed a multitude of uncoordinated, inconsistent, and often duplicative measurement and reporting initiatives. Federal agencies, states, payers, employers, and providers have their own approaches, often focusing on different measures, or the same things measured differently.

The result is the danger that, in the name of promoting improvement, another source of health care inefficiency will be created. The full benefits of investments in measurement also are being lost, because variation leads to results that cannot be compared across geographic areas, institutions, or populations. The purpose of this report is to promote the effectiveness of the measurement enterprise in the United States by identifying a parsimonious set of core metrics that deserve widespread implementation and to suggest how that implementation might occur. In producing the report, the study committee learned some important lessons.

First, current measurement efforts are truly problematic. A preliminary survey conducted in support of this study found that health systems require an average of 50 to 100 full-time equivalent employees, including physicians, at a cost ranging from \$3.5 to \$12 million per year, to carry out these efforts. Surveys of measure requirements and reporting programs have found significant inefficiencies and redundancies, due in part to minor variations in measure methodologies that lead to multiple different reporting requirements for the same target.

Second, as valuable as it is, measurement is not an end in itself. It is a tool for achieving health care goals. Readers will note that the core metric set proposed in this report starts with goals, proceeds through elements that embody or contribute to those goals, and then associates measures with those elements. In many cases, the Committee could not find existing measures that precisely capture valued ends. The Committee views this not as a shortcoming but as a major step forward. Identifying these gaps made it possible to support improvement in areas that may be neglected because, for whatever reasons, measure developers have not focused on them.

Third, measurement will fail if it is left to the experts. Because measures reflect goals and aspirations, their development is fundamentally a political process in the best sense of that term. In the pluralistic, decentralized U.S. health system, agreement on goals and aspirations and corresponding measures of their attainment must involve key stakeholders at every level of the system. The Committee believes the framework proposed herein is useful for facilitating consensus on goals and specific measures, but it understands that the process of reaching agreement on measurement approaches is as important as the technical specifications of the measures themselves. In that sense, this report should be seen as the beginning, not the end, of the journey toward a widely accepted set of core metrics for better health at lower cost.

Fourth, for a number of reasons, the report does not lay out a final, finely specified, parsimonious set of core metrics that will immediately solve all of the nation's measurement problems. The Committee did not have the time, resources, or expertise to specify metrics or to develop composite measures where consensus does not already exist on those indicators. Also, although the Committee consulted widely with stakeholders, both publicly and privately, it did not represent all of the stakeholders whose views should influence, and who should embrace, a final set of core metrics. Furthermore, the Committee increasingly came to believe that the core metrics set may need to vary slightly (although with forethought and coordination) at different levels of the health care system, depending on the varying responsibilities and capabilities of stakeholders at those levels. Thus, the core metric set used by state public health agencies to hold themselves accountable would likely vary from the core metric set used by an independent group of five cardiologists practicing in a suburban community. The Committee simply did not have the resources to develop the several related core metric sets that would be required, but it does believe that *all* of those sets should be aligned in demonstrating how each stakeholder is contributing to a set of overarching goals such as those elaborated in this report.

The Committee is grateful to the sponsors of this project—the Blue Shield of California Foundation, the California HealthCare Foundation, and the Robert Wood Johnson Foundation—and to the Institute of

Medicine (IOM) for supporting its work. It is also grateful to Dr. Michael McGinnis for his leadership of the study process on behalf of the IOM, and to the incredibly talented and hardworking IOM staff who supported this study—Elizabeth Malphrus and Elizabeth Johnston—who deserve the lion’s share of whatever credit the report receives.

Finally, I would personally like to thank the remarkably insightful and hardworking members of the Committee. They took time from other pressing responsibilities to volunteer their expertise for the purpose of improving Americans’ health and health care. The future of the nation’s health system depends in no small part on the willingness of citizens such as these to contribute to the common good.

David Blumenthal, *Chair*
Committee on Core Metrics for Better Health at Lower Cost

Acknowledgments

This report reflects the contributions of many people. The Committee would like to acknowledge and express its appreciation to those who so generously participated in the development of this report.

First, we would like to thank the sponsors of this project, the Blue Shield of California Foundation, the California HealthCare Foundation, and the Robert Wood Johnson Foundation, for their financial support.

The Committee's deliberations were informed by presentations and discussions at four meetings held between August 2013 and June 2014. Additional input was sought from numerous outside stakeholders, and we would like to thank the 126 leading health organizations that provided their input on Committee directives.

A number of the Institute of Medicine (IOM) staff played instrumental roles in coordinating the Committee meetings and the preparation of this report, including Kate Burns, Elizabeth Johnston, Melinda Morin, Valerie Rohrbach, Julia Sanders, Robert Saunders, Francesco Sergi, and Sophie Yang. The Committee would like to acknowledge the contributions and insights of the Robert Wood Johnson Foundation health policy fellows who participated in this study—Jennifer Devoe and Samuel Johnson. The Committee would also like to thank Laura DeStefano, Chelsea Frakes, Greta Gorman, and Rebecca Morgan for helping to coordinate the various aspects of report review, production, and publication. Committee consultant Rona Briere, Briere Associates, Inc., made indispensable contributions to the report production and publication processes. Additionally, we would like to thank both Jay Christian and Casey Weeks for their contributions to the graphic portrayal and cover of this report. The Committee would

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With meaningful coordination, measurement can realize its potential as a tool for driving and enabling improvements in the nation's health and health care and managing costs. We look forward to building on the ideas presented in this report toward achieving a continuously learning health system.

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* Please also see the Appendix D Supplement available at www.nap.edu/catalog/19402 under the Resources tab.

Abstract

While the health measurement landscape today consists of a great many high-quality measures, meaningful at some level for their intended purpose, the effectiveness of the health measurement enterprise as a whole is limited by a lack of organizing focus, interrelationship, and parsimony in the service of truly meaningful accountability and assessment for the health system. If the effectiveness and efficiency of health expenditures are to be brought into alignment on behalf of better health and lower costs, keen attention and decisive actions will be required of all stakeholders—health professionals, payers, policy makers, and all individuals as patients, family members, and citizens—on what matters most. That is the focus of this report. What matters most for health and health care? What are the most vital signs for the course of health and well-being in America?

To explore this issue and to propose a basic, minimum slate of measures for assessing and monitoring progress in the state of the nation's health, the Institute of Medicine convened the Committee on Core Metrics for Better Health at Lower Cost. This report presents a parsimonious set of core measures for health and health care identified by the Committee, and describes how their focused implementation can contribute to reducing the burden of measurement on clinicians; enhancing transparency and comparability; and most critically, improving health outcomes nationwide.

The Committee identified a set of 15 core measures that together constitute the most vital signs for the nation's health and health care: life expectancy, well-being, overweight and obesity, addictive behavior, unintended pregnancy, healthy communities, preventive services, care access, patient safety, evidence-based care, care match with patient goals, personal

spending burden, population spending burden, individual engagement, and community engagement. In addition to this core measure set, the Committee identified 39 related priority measures, which provide additional texture to the core measure set for stakeholder groups with focused interests in specific areas.

The core measure set is fundamentally a tool for enhancing the efficiency and effectiveness of measurement, efficiency through the potential to diminish the burden of unnecessary measurement and reporting, and effectiveness through the potential to concentrate attention and action on issues that matter most. Implementation of this measure set will depend on leadership at every level of the health system, particularly on the leadership of the Secretary of the U.S. Department of Health and Human Services, who is the natural mainstay of the coordinated, multi-stakeholder process for refining and implementing the core measures that the Committee envisions in its recommendations. There is some irony in the fact that an effort aimed ultimately at simplifying entails complex responsibilities. But the Committee is confident that the results of this effort will be real, vital—and measurable.

Summary

Progress in any human endeavor is a product of an understanding of the circumstances in play, the tools available to address the controllable factors, and the resolve to take the actions required. Basic to each is the choice of measures—measures that give the best sense of challenges and opportunities, measures that guide actions, and measures that can be used to gauge impact. In times of rapid change and constrained resources, measures that are important, focused, and reliable are vital.

These are the circumstances in health and health care today. For Americans, health care costs and expenditures are the highest in the world, yet health outcomes and care quality are below average by many measures (OECD, 2013). If the effectiveness and efficiency of health expenditures are to be brought into alignment on behalf of better health and lower costs, keen attention and decisive actions will be required of all stakeholders—health professionals; payers; policy makers; and all individuals as patients, family members, and citizens—on what matters most. That is the focus of this report. What matters most for health and health care? What are the vital signs for the course of health and well-being in America?

As the number of available measures continues to grow without concomitant gains in health outcomes, responsibilities for assessing, measuring, and reporting can become a burden with marginal benefit (Meltzer and Chung, 2014). Identifying and prioritizing the most powerful among these myriad measures at each level of activity—establishing core measures—can enable the health system to work in a coordinated fashion with many stakeholders, most importantly with patients, citizens, and communities, toward a shared vision of America’s health future.

The development and adoption of core measures will depend on a culture of shared accountability for health. Responsibility for improving the nation's health outcomes must be assumed by all members of the multisectoral health system, defined broadly to include the full array of sectors and entities—from clinicians and hospitals to schools and families—that influence the health of the population through their activities (IOM, 2012b). By garnering the attention of all stakeholders involved in the health system, measurement activities can be coordinated and redirected toward those outcomes that are most meaningful to all.

STUDY CHARGE

Prompted by growing awareness of the need both to reduce the burden of unnecessary and unproductive reporting and to better focus measurement on change that matters most, the Institute of Medicine (IOM) appointed the Committee on Core Metrics for Better Health at Lower Cost to conduct this study. The Committee's work was made possible by the financial support of three sponsors: Blue Shield of California Foundation, the California HealthCare Foundation, and the Robert Wood Johnson Foundation. The charge to the Committee was to “conduct a study and prepare a report directed at exploring measurement of individual and population health outcomes and costs, identifying fragilities and gaps in available systems, and considering approaches and priorities for developing the measures necessary for a continuously learning and improving health system.” Specifically, the Committee was directed to

- “consider candidate measures suggested as reliable and representative reflections of health status, care quality, people's engagement and experience, and care costs for individuals and populations;
- identify current reporting requirements related to progress in health status, health care access and quality, people's engagement and experience, costs of health care, and public health;
- identify data systems currently used to monitor progress on these parameters at national, state, local, organizational, and individual levels;
- establish criteria to guide the development and selection of the measures most important to guide current and future-oriented action;
- propose a basic, minimum slate of core metrics for use as sentinel indices of performance at various levels with respect to the key elements of health and health care progress: people's engagement and experience, quality, cost, and health;

- indicate how these core indices should relate to, inform, and enhance the development, use, and reporting on more detailed measures tailored to various specific conditions and circumstances;
- identify needs, opportunities, and priorities for developing and maintaining the measurement capacity necessary for optimal use of the proposed core metrics; and
- recommend an approach and governance options for continuously refining and improving the relevance and utility of the metrics over time and at all levels.”

The Committee carried out this study through four face-to-face meetings; multiple teleconferences; and solicitation of input broadly from the field, both by submitting written requests and by receiving testimony at public meetings. Three subCommittees were formed to address the analytic framework for the study, potential core measures, and implementation priorities. Two full surveys were developed and administered to the Committee members, soliciting their insights on the relative merits of and alternatives to candidate measures, their opinions on priorities, and any issues that may not have received adequate attention.

This summary describes the key context for this study, including the challenge of the burden of measurement, and then presents the Committee’s approach to selecting core measures. Next is a brief description of each of the selected measures, followed by a discussion of the anticipated implementation process. The final section presents the framing perspectives that underlie the Committee’s recommendations, followed by the recommendations themselves as an action agenda for the full range of stakeholders important to improving health and health care in America.

STUDY CONTEXT

Measurement in Health and Health Care

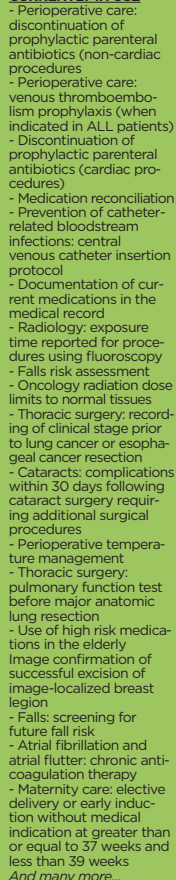
A dominant feature of the health system is its fragmentation, and that fragmentation is reflected in the measures currently in use. Health measurements are requested and required by many organizations for many purposes, including monitoring of population and community health status, monitoring of personal health, assessment of quality and patient experience, transparency, public reporting and benchmarking, performance requirements, and funder reporting. These requests and requirements for reporting rarely are synchronized among the various organizations involved. Because of the great number and variety of these organizations, the total number of health and health care measures in use today is unknown. Nonetheless, reference points such as the Centers for Medicare & Medicaid Services (CMS)

Measure Inventory, which catalogs nearly 1,700 measures in use by CMS programs, indicate that they number in the thousands (CMS, 2014). The National Quality Forum's (NQF's) measure database includes 630 measures with current NQF endorsement (NQF, 2014). The National Committee for Quality Assurance's (NCQA's) Healthcare Effectiveness Data and Information Set (HEDIS), used by more than 90 percent of health plans, comprises 81 different measures (NCQA, 2013). And in 2010, the Joint Commission required hospitals to provide data for measures selected from a set of 57 different inpatient measures, 31 of which were publicly reported at the time (Chassin et al., 2010).

Although many of these measures are of high quality and provide valid and useful information about health and health care, many examine only slight variations of the same target. Furthermore, numerous measures in use today are similar enough to serve the same purpose, but they also differ enough to prevent direct comparison among the various states, institutions, or individuals interested in the same target.

In addition to the sheer number of measures, another challenge lies in their focus. Many measurement programs limit their focus to narrow or technical components of health care processes instead of targeting outcomes or the multiple factors that lie outside the domain of the traditional health care system but represent the most important influences on health. Without understanding these factors, it will be difficult to make sustainable progress in improving the health of the nation. Figure S-1 presents a schematic of the current profile of measurement in health and health care today, highlighting various safety measures as an example. Even though the measures identified constitute just a partial listing, the graphic illustrates not only the substantial number of measure targets in various categories but also the much larger number of measures used to address these targets.

Despite the call by organizations such as NQF and the U.S. Department of Health and Human Services (HHS) for greater alignment and harmonization in health system measurement, the various efforts remain broadly uncoordinated both horizontally, or across various activities, and vertically, in terms of consistent and comparable measurements at the national, state, local, and institutional levels. The Committee believes that renewed attempts to align and harmonize measures to reduce redundancies and inefficiencies may now succeed because of the significant changes that have occurred in the environment for measurement. Notably, data capture capabilities have grown rapidly, with electronic health records and other digital tools seeing increasingly widespread use (IOM, 2011). The emerging health information technology infrastructure could support a real-time measurement system for the routine collection of information about care processes, patient needs, progress toward health goals, and individual and population health outcomes. The transformation of technology provides an



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opportunity to measure what matters most, enabling goals to drive measures rather than measures driving goals.

The Measurement Burden

Change is clearly needed. The rapid proliferation of interest in, support for, and capacity for new measurement activities has paradoxically blunted the effectiveness of those efforts. Absent a blueprint, strategy map, or common set of reference points, the variation inherent in thousands of disconnected measurement and accountability systems limits both insights on the comparability of different sections or levels of the health system and a focus on issues of highest priority. A case can be made that, while the health measurement landscape today consists of a great many high-quality measures, meaningful at some level for their intended purposes, the effectiveness of the health measurement enterprise as a whole is dependent on improved organizing focus, interrelationship, and parsimony in the service of truly meaningful accountability and assessment for the health system. Many process-oriented care measures have helped improve and standardize care as well as led to improved health outcomes; they are important. And many outcome measures are subject to the challenge of reliable risk adjusting. However, the fact that outcome measures are agnostic as to the mechanism or approach taken to achieve improvement ensures both that innovation is encouraged and that the measures used are likely to remain useful over a long period of time. Consequently, unless a process measure, or composite process measure set, offered the prospect of a broader impact on system performance, the Committee tended to give outcome measures priority over process measures.

Many of the individual measures in use today were developed and implemented for a particular purpose and circumstance, without attention to the broader context. The rapid growth in measures that health care organizations are required to report is due in part to redundancies and inefficiencies in data collection and measure specification, such that different organizations interested in assessing the same target or feature require different measures with different specifications. The result is a measurement system that lacks standardization for the assessment and reporting of data on commonly assessed health concepts. For example, the HHS Measure Policy Council initially found that across six HHS measurement programs, 61 different measures were in use for smoking cessation, 113 for HIV, 19 for obesity, and 68 for perinatal health (HHS, 2014a). The HHS Measure Policy Council continues to work across federal measurement programs to streamline and align federal measures, making considerable progress over the past few years.

As a result of this proliferation of measures, existing requirements impose a significant burden on providers, organizations, and the U.S. health care system as a whole. The development and validation of measures and the collection, analysis, and maintenance of data are ultimately coupled with an increasing volume of improvement initiatives. A 2006 study of a sample of hospitals found that each hospital reported to an average of five reporting programs; the authors identify 38 unique reporting programs (Pham et al., 2006). And a 2013 analysis found that a major academic medical center was required to report on more than 120 quality measures to regulators or payers, with the cost of measure collection and analysis consuming approximately 1 percent of net patient service revenue (Meyer et al., 2012). These activities often are viewed as a generally unquantified and undercompensated burden for the U.S. health care system and its various stakeholders. The return on investment for measurement with respect to improved quality and reduced cost of care falls short of expectations, in part because of inefficiency in the use of health measures. While preliminary in nature, an analysis developed in the context of the Committee's work, based on the results of interviews with the leaders of 20 health systems, confirmed the rapid growth in reporting requirements, the high frequency of inconsistency in similar measures, the large time commitment required of staff and clinicians, and costs that typically number in the millions of dollars.

A core measure set cannot immediately eliminate this burden, but it can ensure stronger attention to the most important issues, as well as improvements in focus and accuracy for efforts in reporting, efficiency, innovation, and performance. A measure set that offers a reliable reflection of the status of health and health care at the national, state, local, and institutional levels will draw sustained attention to what is truly important, focus on results rather than processes, reduce the number of measurements required for reporting purposes, increase flexibility and capacity for innovation at the local and institutional levels, and enhance the effectiveness and efficiency of system performance. In short, a core measure set is a tool that can be used to accelerate progress toward better health at lower cost.

APPROACH TO THE SELECTION OF CORE MEASURES

Starting Point: Domains of Influence

The Committee's starting point in identifying the foci for core measures was assessment of the key domains of influence—that is, those with the greatest potential to have a positive effect on the health and well-being of the population and each individual within it, now and in the years to come. The domains identified in the Committee's charge include healthy people,

care quality, care costs, and people's individual and collective engagement in health and health care. Implicit in the Committee's charge is the notion that, while the nation's foundational societal aspiration is healthy people, the health of the population is the product of the ability to make progress in each of these interrelated domains. Achieving the goal of healthy people depends on environments and cultures that are supportive of health. Gains in the quality of care and population health cannot be sustained without affordable care. Care quality and affordability cannot be optimized without engaged people. Each domain is itself a vital contributor to the nation's health profiles while also being fundamentally intertwined with the others.

Healthy People

The foundational motivation of this report, and of the health system at large, is improving the health of individuals, communities, and the nation. From a population health perspective, the United States faces significant challenges, with chronic disease afflicting nearly half of all adults, violence and injury being the leading cause of death for people aged 1 to 44, and childhood obesity—a harbinger of poor health in adulthood—affecting 17 percent of America's children (CDC, 2012a; Ogden et al., 2014; Ward and Schiller, 2013). From an international perspective, the United States is below average on a range of health measures, as illustrated in the National Research Council (NRC)/IOM report *U.S. Health in International Perspective: Shorter Lives, Poorer Health* (NRC and IOM, 2013). The United States spends nearly twice the OECD average on health care, yet Americans have a life expectancy of 78.7 years, below the OECD average of 80.1 years (OECD, 2013). To help improve population health, a core measure set must provide solid indicators of progress toward that goal.

Care Quality

While health care services are not the only or even the most important determinant of population health, their quality matters to individuals and families and influences both the outcomes and the costs of care. A major impetus for transforming the measurement enterprise is the health system's uneven performance. Improving that performance creates an obvious need for better guideposts. Islands of excellence exist alongside areas in need of improvement. Clinical care has seen marked progress, as illustrated by such advances as antibiotic therapies for infectious diseases; multiple interventions for cardiovascular disease, from beta blockers to percutaneous coronary intervention (PCI) and coronary artery bypass grafting (CABG); and pharmaceutical agents tailored to the specific genetic characteristics of HIV, a microbe identified just 30 years ago (Fauci, 2003; FDA, 2011;

Fischl et al., 1987; IOM, 2012a; Nabel and Braunwald, 2012; Simon et al., 2006). At the same time, the system has compelling needs for improvement. Medical errors remain common, occurring in almost one-third of hospitalized patients (Classen et al., 2011; Landrigan et al., 2010; Levinson, 2010, 2012). Health care also has become increasingly complex, resulting in shortcuts in decision making and clinical processes, fragmentation of care, preventable errors, and a lack of accountability.

Care Costs

The health care system is characterized by inefficiencies in spending and resource use, such that, according to the 2013 IOM report *Best Care at Lower Cost* (IOM, 2012a), an estimated 30 percent of health care spending is wasted. Health care costs now constitute almost a fifth of the nation's economy (Hartman et al., 2013) and pose a challenge for the budgets of the federal and state governments, businesses, and families. Costs vary significantly and with no correlation with quality among different regions of the country, states, localities, and even clinicians operating in the same practice (IOM, 2013). High out-of-pocket costs place financial pressure on individuals and families, potentially leading people to avoid or delay care; to ration personal care resources by, for example, taking medications less frequently than prescribed; and to incur significant debt.

People's Engagement in Health and Health Care

Patients, consumers, and the broader public are playing an increasing role in health and health care, facilitated by changes in technology and access to information, new models of care delivery, improved understanding of the link between progress in chronic disease and patient engagement, and legislative and payment reforms. Evidence suggests that people who are more actively involved with their health and health care may have improved outcomes. Research has found that people who use health-related social networking sites, such as PatientsLikeMe, TuDiabetes, and TheBody, show improved treatment adherence, have a better understanding of their medical conditions, and feel more in control of their disease management (Grajales et al., 2014; Wicks et al., 2010). Importantly, in the spirit of shared responsibility for maintaining the health of individuals and the population, the notion of engagement includes both the individual and the community. At the community level, such initiatives as those focused on preventing motor vehicle-related injuries, reducing sedentary behavior in workplaces, and reducing exposure to secondhand smoke that have led to significant improvements in health outcomes often depend on the active engagement of communities. While much remains to be learned on how to

facilitate greater individual and public engagement, the importance of doing so is clear and compelling.

Cross-Domain Priority: Disparities

In developing a core measure set, it is essential to focus on disparities to document progress toward and achievement of the goals of improved health status, care, quality, affordability, and public engagement. Substantial disparities exist among and within subpopulations in the United States with respect to the relative impact of each of the domains of influence on health and health care, including disparities by race, ethnicity, income, education, gender, geography, and urban or rural populations. In the aggregate, this issue represents one of the greatest health and health care challenges faced by the nation (HHS, 2011). While 70 percent of non-Hispanic white persons in the United States reported excellent or very good health in 2013, this was the case for only 60 percent of non-Hispanic African American persons and 57 percent of Hispanic persons (CDC, 2013). Individuals from minority racial and ethnic backgrounds experience a higher incidence and severity of certain diseases and health conditions relative to white individuals (APHA, n.d.). For example, the rate of hospitalization for uncontrolled diabetes without complications was almost five times higher in African Americans and four times higher in Hispanics than in whites (Russo et al., 2006). In 2012, difficulty in receiving care was experienced by about 7 percent of high-income individuals but 15 percent of people with family incomes below the federal poverty level (AHRQ, 2012). Children living in families with incomes below the federal poverty level also had lower vaccine coverage than children living in families at or above the poverty level (CDC, 2012b). And racial minorities experience more avoidable procedures, avoidable hospitalizations, and untreated disease than white individuals (Fiscella et al., 2000). Such disparities speak to the need for reliable core data at every level of the health system to help assess, target, and track efforts to close the gap.

Measures as Levers for Action

The Committee undertook its charge with full recognition that measurement in health care is a tool for improvement, not an end point or a solution in itself, as illustrated by the Committee's definition of core measures (see Box S-1). The diversity of current health measures is a reflection of the wide variety of purposes and targets within health care that have the potential to be assessed empirically and monitored or compared systematically as a route to improvement. As defined in Box S-1, core measures, for present purposes, represent a parsimonious set of measures that provide a

BOX S-1
Definition of Core Measures

A parsimonious set of measures that provide a quantitative indication of current status on the most important elements in a given field, and that can be used as a standardized and accurate tool for informing, comparing, focusing, monitoring, and reporting change.

quantitative indication of current status on the most important elements in a given field, and that can be used as a standardized and accurate tool for informing, comparing, focusing, and monitoring change. A core measure set, therefore, is not intended to replace the full range of measures in use today, but is intended to help improve the focus of measures to reduce reporting burden while improving impacts. A core set can raise the profile of the most compelling health challenges facing the nation; draw attention to issues and actions that can trigger broader-scale system improvement; provide a platform for harmonizing efforts to monitor national, state, local, and institutional progress in health and health care; create opportunities for alignment and the resolution of redundancies in areas where measurement is burdensome; and guide the creation of a more robust multilevel data infrastructure.

The analytic framework used by the Committee begins with the identification of goals for health and health care, follows with an assessment of domains of influence that can promote those goals, and then identifies the key elements and measures that most represent those domains. Unlike many other measurement efforts, the Committee's work on developing core measures did not start with the procedures, health care tasks, or conditions that are most commonly measured. Rather, the Committee's approach helped identify ways in which a core measure set might help channel and transform the effectiveness of the many otherwise siloed efforts aimed at engaging the various potentially controllable determinants of health.

Identification of candidate core measures involved an assessment of the most important elements for each of the four domains identified above: for *healthy people*, these were length of life, quality of life, healthy behaviors, and healthy social circumstances; for *care quality*, they were prevention, access to care, safe care, appropriate treatment, and person-centered care; for *care costs*, they were affordability and sustainability; and for *people's engagement in health and health care*, they were individual engagement and community engagement.

BOX S-2
Criteria for Core Measure Development

Criteria for core measures

- Importance for health
- Strength of linkage to progress
- Understandability of the measure
- Technical integrity
- Potential for broader system impact
- Utility at multiple levels

Criteria for the set












- Systemic reach
- Outcomes-oriented
- Person meaningful
- Parsimonious
- Representative
- Utility at multiple levels

As various candidate measures were considered, the Committee employed two sets of criteria: one for the selection of each core measure and the other for compilation of the set as a whole (see Box S-2). With respect to the individual measures, these criteria included importance for health, strength of linkage to progress, understandability of the measure, technical integrity, potential for broader system impact, and utility at multiple levels. While the attributes of individual measures are important, additional considerations are needed to construct a high-quality set of measures. The core set therefore resulted from application of the second set of criteria: systemic reach, outcomes-oriented, person meaningful, parsimonious, representative, and utility at multiple levels.

THE CORE MEASURE SET





Applying the above criteria, the Committee arrived at the core measure set presented in Table S-1. In this table, the *domains* represent the highest level of organization of the core measures, serving as a guiding framework for their selection and application; the *key elements* represent the broadest conceptually discrete components of the respective domains; the *core measure foci* express the most representative and specific focus for measurement for each key element, translating the conceptual key element into something measurable; and the *best current measures* are measures selected by the Committee from among those now in use in various settings as most representative of the foci of the specified core measures. While many of these best current measures are imperfect reflections of the core measures, they are intended to demonstrate how the core measure set could be applied today,

TABLE S-1 Core Measure Set

Domain	Key Element	Core Measure Focus		Best Current Measure	Current National Performance ^a
Healthy people	Length of life		Life expectancy	Life expectancy at birth	79-year life expectancy at birth
	Quality of life		Well-being	Self-reported health	66% report being healthy
	Healthy behaviors		Overweight and obesity	Body mass index (BMI)	69% of adults with BMI 25 or greater
			Addictive behavior	Addiction death rate	200 addiction deaths per 100,000 people age 15+
			Unintended pregnancy	Teen pregnancy rate	27 births per 1,000 females aged 15 to 19
	Healthy social circumstances		Healthy communities	High school graduation rate	80% graduate in 4 years
Care quality	Prevention		Preventive services	Childhood immunization rate	68% of children vaccinated by age 3
	Access to care		Care access	Unmet care need	5% report unmet medical needs
	Safe care		Patient safety	Hospital-acquired infection (HAI) rate	1,700 HAIs per 100,000 hospital admissions
	Appropriate treatment		Evidence-based care	Preventable hospitalization rate	10,000 avoidable per 100,000 hospital admissions
	Person-centered care		Care match with patient goals	Patient-clinician communication satisfaction	92% satisfied with provider communication

continued

TABLE S-1 Continued

Domain	Key Element	Core Measure Focus		Best Current Measure	Current National Performance ^a
Care cost	Affordability		Personal spending burden	High spending relative to income	46% spent >10% income on care, or uninsured in 2012
	Sustainability		Population spending burden	Per capita expenditures on health care	\$9,000 health care expenditure per capita
Engaged people	Individual engagement		Individual engagement	Health literacy rate	12% proficient health literacy
	Community engagement		Community engagement	Social support	21% inadequate social support

^a See Chapter 4 for current performance sources and definition of terms.

with the understanding that significant measure development is needed in many of these areas.

Each core measure focus identified by the Committee ranks among the most important foci for action at the national, state, local, and even institutional levels. The Committee has not specified all the core measures in detail because many will need further collaborative definition and refinement before being fully applicable. Standardized measurement approaches exist for life expectancy and overweight and obesity, but such widely accepted standardized measures are absent for most of the other foci, including well-being, addictive behavior, healthy communities, evidence-based care, spending burden, and individual and community engagement. Additionally, many of the core measures will need to be adapted when used at different levels of the health system. For example, while gross domestic product (GDP) is a useful tool for assessing cost at the national level, it clearly cannot be applied directly at the local or the institutional level. An alternative measure, such as total cost of care, is needed to assess spending for a population served by an institution. This adaptation for different levels will depend on active involvement and collaboration among relevant stakeholders and therefore lies beyond both the expertise of the Committee and the appropriateness of its efforts.

The lack of proven consensus measures is particularly notable for individual and community engagement. The Committee's charge called for inclusion of measures for these key elements, and there was strong sentiment among the Committee members that these are essential influences on the national goals for health and health care. However, Committee members' perspectives were divided on the question of whether the strength and precision of the definitions and measures available for engagement warranted their inclusion alongside the domains of health, care quality, and care cost. Individual and community engagement clearly work in service to, and as an element in the success of, activities directed at the Institute for Healthcare Improvement's (IHI's) Triple Aim of better health, better patient experience of care, and lower costs. Still, considerable definitional and analytic work is required to develop practical measures that can reliably capture the extent to which individuals are prepared for and engage in effective participation in health and health care planning, delivery, and improvement. Additionally, research is needed to explore how levers available for community-wide action are being employed effectively for improvement on matters of central importance to the health of the population. Given the identification of engagement as a domain in the Committee's statement of task and the acknowledgment within the Committee that engagement represents an important—if underdeveloped—element of the changing landscape of health, the Committee's deliberations were guided by the four domains of health, care, quality, care cost, and engagement.

Measure development and standardization were beyond the scope of the Committee's charge. To accelerate the development and application of a fully specified core measure set, however, the Committee has specified what in its judgment is the best currently available measure for each core measure focus. This measure set, while imperfect, represents in the Committee's view a powerful starting set of "vital signs" for tracking progress toward improved health and health care in the United States. The Committee believes further that the core measure set recommended herein comprises the vital signs on the status and progress of the nation's health and health care, that a single measure can be chosen or developed for each of the core measure foci within each domain of influence, and that the development of a standardized measure is essential for each focus. The Committee also believes that, when applied, attention to these core measure foci will have the multiplier effect of improving performance broadly throughout the health and health care organizations engaged in their use.

Although they may be characterized in different ways and often are interrelated at some level, each of the key elements shown in Table S-1 is central to progress in health and health care. Quality of life is an aim basic to all individuals, and while length of life is not an immutable goal for every person at every stage of life, it is an accepted standard for the overall health

of populations. It also is now well established that the health of populations is substantially shaped by factors outside of health care, including patterns of health-related behaviors and social circumstances such as physical environments and socioeconomic status. High-quality care is a function of the interplay among access to care, prevention, and appropriate treatment. The interplay among and the reinforcing nature of these elements was a factor in the identification and consideration of core measures.

Brief descriptions follow for each of the core measure foci. As noted above, because most of these foci are not supported by widely accepted standardized measures accessible for application at every level of the health system, the Committee has recommended the best current measures shown in Table S-1 (see also Chapter 4). Examples include the use of childhood immunization status as a best current measure for the delivery of preventive services and self-reported health status as a measure of well-being. Many of these best current measures are currently imperfect because of limitations in scope, reliability, generalizability, or conceptual boundary and will require substantial work. For this reason, the Committee has recommended that, as stakeholders at various levels try out their own proxies for the core measure foci, the Secretary of HHS steward a broadly inclusive process to marshal the nation's experience and expertise in the development of the standardized set of core measure foci (see Chapter 5).

Life expectancy: Life expectancy is a validated, readily available, and easily comprehensible measure for a critical health concept, length of life, based on the simple logic that healthier people tend to live longer. Because life expectancy depends on a full range of individual and community influences on health—from cancer to homicide—it provides an inclusive, high-level measure for health, broadly defined.

Well-being: Life expectancy and death rates from various diseases and injuries provide clear, “bright line” measures of health in a population group, but health and well-being in the population comprise many other components, including illness from chronic or acute diseases, injury, functional capacity, mental health, sense of security, and social networks. As the World Health Organization notes, health is “not merely the absence of disease” (WHO, 1946). The health of an individual has both objective and subjective dimensions. In fact, people's perception of their own health is not just a reliable indication of well-being but often a predictor of utilization of and satisfaction with health care.

Overweight and obesity: Overweight and obesity represent a significant challenge to Americans' health. Their prevalence is a feature of American life with causes and consequences that extend beyond the scope of the health system, including socioeconomic, cultural, political, and lifestyle factors—in particular diet and physical activity, which together constitute leading causes of early death. Therefore, reducing the prevalence of

overweight and obesity in the United States—and by extension, improving health and reducing the costs of care across the nation—will depend on the coordinated efforts of many stakeholder groups.

Addictive behavior: Addiction and addictive behavior represent a significant and complex challenge for the health system, as well as for communities and families. Approximately 18 percent of American adults smoke, 17 percent of adults binge drink, and an estimated 9 percent of people aged 12 years and older were found to have used an illicit drug within the past month (Agaku et al., 2014; CDC, 2012c; NCHS, 2014). The estimated economic cost of substance abuse and addiction in the United States is \$559 billion per year (NIDA, 2008).

Unintended pregnancy: Unintended pregnancy presents a significant challenge for both individual and community health. According to a report from the Centers for Disease Control and Prevention's (CDC's) Division of Vital Statistics, it is the most direct available measure of women's ability to choose the number and timing of their pregnancies. As such, it is a measure that aggregates a variety of social, behavioral, cultural, and health factors, particularly the availability and use of both knowledge and tools for family planning.

Healthy communities: Individual health is a function of a wide range of socioeconomic and community factors, ranging from environmental quality to infrastructure to education and social connections. Thus, the health of all individuals is closely tied to the health of the community in which they live, such that individual actions to improve health can benefit the community, and community actions to improve health can benefit each individual member. Community health includes critical elements of health that fall outside of the care system but have a major impact on care and health outcomes, such as housing, employment, and environment.

Preventive services: Preventive services—immunization, screening, counseling, and chemo prophylaxis—present a valuable opportunity for both improving health and adding value. Based on rigorous evidence standards, the U.S. Preventive Services Task Force recommends a range of services for different groups, from screening for hearing loss for infants to tobacco cessation counseling for current smokers (USPSTF, 2010).

Care access: The ability to receive care when needed is a critical precondition for a high-quality health system. Unmet need for health care may occur for a variety of reasons, including lack of or insufficient health insurance, clinician shortages, lack of transportation, cultural and linguistic barriers, and physical limitations. Regardless of the cause for unmet need, the avoidance or lack of needed care has a negative impact on health, which may result in the deferral of treatment until a condition becomes more serious and ultimately in higher costs for both the individual and the health system.

Patient safety: Avoiding harm is the primary obligation of the health care system, yet despite the steady decline in hospital mortality in the United States, one in every three hospitalized patients may be harmed during their stay, and one in five Medicare patients are rehospitalized within 30 days of admission (IOM, 2012a). These harms often are associated with certain risk factors, such as the use of indwelling medical devices, surgical procedures, injections, contaminations of the care setting, and misuse of antibiotics. Infections acquired in care settings are estimated to have an economic cost in the billions and to contribute to tens of thousands of lives lost each year (HHS, 2014b). Ensuring that patients are safe in all of their interactions with the health care system requires a systematic, coordinated approach to the provision of care services, as well as a culture of care in which safety is a priority.

Evidence-based care: One of the central challenges for the American health system is ensuring that care delivered is based on the best available scientific evidence of appropriateness and effectiveness. While advances in medicine and health care have led to substantial gains in life expectancy and quality of life over time, a variety of estimates suggest that many people still fail to receive recommended care or they receive care not based on scientific evidence. For example, one study found that in 2003, people received only a little more than half of recommended care (McGlynn et al., 2003). It is estimated that one-third of all health care expenditures do not contribute to improving health. Careful work is needed to identify the most reliable indices that an organization is structurally, culturally, and systematically devoted to ensuring that care delivered is care most important to patient health.

Care match with patient goals: Measuring person-centered care accurately and consistently can enable better understanding and new approaches for ensuring that the health care system responds to the needs and values of patients. Systematically determining patient aims and perspectives ensures that the health care system is focusing on those aspects of care that matter most for patients. In many ways, a focus on patient goals and experience represents a cultural shift in the nation's understanding of health and health care, one necessary to the delivery of truly effective care.

Personal spending burden: As noted earlier, the United States spends more on health care than any other country, even after adjusting for the cost of living, yet the health outcomes of a majority of its citizens are far from the best in the world. This mismatch between cost and quality has adverse impacts not only on the American economy but also on the health and economic security of individuals. Care that is too expensive can limit people's access to care, lead people to self-ration or altogether avoid care, or limit people's ability to purchase other goods and services of value to them. Individual spending burden provides an indication of the financial

burden imposed by health care on households and, by extension, the limits that health care may place on other areas of consumer spending.

Population spending burden: In addition to the burden placed on individuals, health care spending consumes a large portion of the nation's gross domestic product, dwarfing the relative investments of other countries in health care. While health care costs have grown more slowly than projected over the past few years, the magnitude of spending on care remains a significant challenge for the U.S. economy and has led to a growing number of initiatives aimed at curbing costs through performance-based pay, accountable care, and other models that challenge the standard approach of payment based on volume of services. The population spending measure recommended by the Committee will generate insights for decision makers not just at the national level but also at the state, local, and institutional levels.

Individual engagement: People play an active role in their own health, as choices about diet, exercise, lifestyle, and other behaviors have well-known implications for the development of chronic disease and other health consequences. Therefore, it is critical for people to be aware of their options and responsibilities in caring for their own health and that of their families and communities. Individual engagement means that people, patients, and families play an active role not only in their care but also in the range of factors that contribute to their health and the health of others, including environment, community, economy, social well-being, and generally health-oriented community culture. Individuals who are engaged are ready to manage their own health and health care, having the knowledge, skills, and tools needed to maximize their individual and family well-being.

Community engagement: In addition to engagement in health by individuals, a health-oriented community culture, as reflected in community priorities, investments, and initiatives, is important to improving individual and community health and health care. Across the United States, communities have different levels of resources available and utilized to support people's efforts to maintain and improve their individual and family health. For example, some communities may have better access and availability for certain health facilities and services, such as addiction treatment programs or emergency medical facilities. Similarly, social engagement, such as involvement in elections or volunteering, varies both among and within communities.

The Committee also recognizes that, while ripple or multiplier effects are anticipated as a result of their use, the 15 core measure foci identified will not be sufficient to meet all of the interests of a given organization. To begin to accommodate this challenge, the Committee also identified 39 "related priority measures" for consideration, presented in Table S-2. These measures, together with the core measures, give a more detailed view of the

TABLE S-2 Core Measure Set with Related Priority Measures








Core Measure Focus	Related Priority Measures
 Life expectancy	Infant mortality Maternal mortality Violence and injury mortality
 Well-being	Multiple chronic conditions Depression
 Overweight and obesity	Activity levels Healthy eating patterns
 Addictive behavior	Tobacco use Drug dependence/illicit use Alcohol dependence/misuse
 Unintended pregnancy	Contraceptive use
 Healthy communities	Childhood poverty rate Childhood asthma Air quality index Drinking water quality index
 Preventive services	Influenza immunizations Colorectal cancer screening Breast cancer screening
 Care access	Usual source of care Delay of needed care
 Patient safety	Wrong-site surgery Pressure ulcers Medication reconciliation
 Evidence-based care	Cardiovascular risk reduction Hypertension control Diabetes control composite Heart attack therapy protocol Stroke therapy protocol Unnecessary care composite
 Care match with patient goals	Patient experience Shared decision making End-of-life/advanced care planning
 Individual spending burden	Health care–related bankruptcies
 Population spending burden	Total cost of care Health care spending growth

TABLE S-2 Continued

Core Measure Focus	Related Priority Measures
 Individual engagement	Involvement in health initiatives
 Community engagement	Availability of healthy food Walkability Community health benefit agenda

state of the health system are sufficiently granular and specific to be actionable by stakeholders as needed for their particular circumstances, and serve as example components of composite measures to be developed.

IMPLEMENTATION: PUTTING THE CORE MEASURES TO USE

The successful implementation of the core measures will depend on their relevance, reliability, and utility to stakeholders. Key considerations in the introduction of any new initiative in a complex environment should include the multiple competing priorities of stakeholders, the degree of change proposed, and the overall pace of change in the system. Progress can be accelerated by ensuring that the core measure set is applied by, and adds value to, existing health programs, stakeholders, and activities with measure requirements.

Prominent examples of such existing programs, stakeholders, and activities include the Meaningful Use Program, the Medicare Shared Savings Program, payers and purchasers, state Medicaid waivers, categorical grants, community health planning, community benefit requirements, and related health care reform provisions. Table S-3 highlights some of the ways in which the core measure set can help streamline and improve the measurement and operational efficiencies of these entities.

Especially important to successful implementation will be the leadership brought to bear in the process. Leadership will be required from virtually every level of health and health care throughout the nation. CEOs of health care organizations, payers and employers, standards organizations, and public health agencies all are centrally important to the uptake, use, and maintenance of core measures as practical tools. But in an effort of this breadth and depth, stewardship and standardization of the core analytics are key, as are the levers for accelerating application. In the Committee’s view, the Secretary of HHS, with the support and leadership of the Executive Office of the President, is the appropriate person to assume the implementation, stewardship, and governance responsibilities required for the

TABLE S-3 Utility of the Core Measure Set

Activity	Examples of Utility of Core Measures
Meaningful Use Program	Provide standardized measures for every electronic health record, contributing reliability and comparability to information on health and health system performance and advancing the goal of Meaningful Use.
Medicare Shared Savings Program	Facilitate comparability in the application of the 33 accountable care organization (ACO) measures, and provide an important tool for gauging the extent to which an ACO is delivering on the intended care and population health outcomes.
Payers and purchasers	Provide a stronger, more sustained focus on outcomes with standardized tools for assessing the performance of health care organizations and clinicians and results for covered populations.
State Medicaid waivers	Streamline and standardize the assessment and comparison of performance in improving core health outcomes under different circumstances and forms of waiver authority and across states, counties, facilities, and time.
Categorical grants	Enhance comparisons across sites and time; help identify best practices across programs, communities, and states; and facilitate look-back studies to identify postgrant results on certain important outcome dimensions.
Community health planning	Provide well-timed assessment of progress and changing needs for attention and resources, especially important to meeting growing responsibilities of health systems for population health improvement.
Community benefit requirements	Focus community benefit initiatives on issues most important to outcomes, and improve prospects for targeted coordination of efforts involving multiple organizations.
Related health reform provisions	Increase the quality and transparency of health, health care, and cost information to assist in people's health and health care choices.

core measures to reach the full potential of their successful application and contribution to progress in health and health care. It is the HHS Secretary who directs the agencies most involved in the collection and use of health data; who signs off on reporting requirements and responsibilities; who is centrally positioned to convene and work with the key stakeholders; and who, as the leader most responsible for the nation's effectiveness and efficiency in delivering better health at lower cost, has the greatest potential to unlock the capabilities of the core measure set.

A first-order implementation leadership opportunity lies in the Secretary's ability to embed the use of the core measure set in the programs

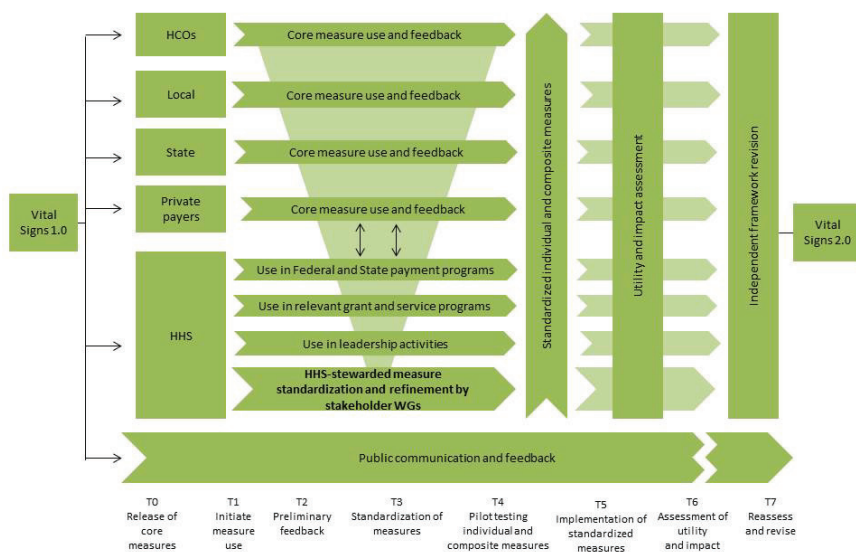


FIGURE S-2 Core measures implementation schematic.

NOTE: HCO = health care organization; HHS = U.S. Department of Health and Human Services; WG = work groups.

administered within HHS, as well as to help overcome the obstacles presented by the many entities with vested interests in maintaining the various measures and measure sets that favor their programs and priorities. As a member of the cabinet, the HHS Secretary also has the opportunity to facilitate cross-sectoral approaches to improving health by working with housing, transportation, environment, education, agriculture, and labor authorities.

Similarly, the HHS Secretary is the appropriate person to steward the eventual process of amending the core measure set. As times change, the content of the core set will need to change accordingly, and a process for periodic reassessment of its content will need to be developed. If the pragmatism of the principle of parsimony is a guide, and the Committee believes it should be, that reassessment process must be carefully designed and managed to guard against pressures to accommodate special causes. Specifically, all analyses, deliberations, and recommendations should be widely inclusive in process but completely independent of any particular stakeholder perspective in product. The often strongly expressed voices of various interests—economic, political, clinical, social, and otherwise—should be heard but should not overly influence outcomes. Measures reflect and affect

the interests and concerns of many stakeholders. Therefore, the creation of a measure set is more than a technical exercise, and its implementation requires leadership and compromise. To have the benefits of a more parsimonious and less costly measurement system, individuals and groups at different levels will need to be flexible and willing to give up certain autonomy and closely held perspectives in favor of shared benefits. Care in structuring the eventual approach to updating and amending the core set, at such time as that activity is deemed appropriate, will be vital. Presented in Figure S-2 is a schematic overview of the implementation process, illustrating the simultaneous use of the core set by multiple stakeholder groups, along with measure refinement and standardization by stakeholder groups through a development and testing process orchestrated by HHS.

FRAMING PERSPECTIVES AND RECOMMENDATIONS

Summarized in Box S-3 are framing perspectives developed in the course of the Committee's work. These perspectives touch on the key conceptual and practical elements engaged by the core measures and their implementation, and they underpin the Committee's recommendations. Because those recommendations are grounded in the basic notion that achieving the potential of core measures will require broad leadership from stakeholders throughout the nation, they are targeted to, and organized around, stakeholder opportunities and responsibilities. Given the health system's complexity and the interdependence of health stakeholder communities,

BOX S-3 Committee Framing Perspectives

Measurement aims. Measurement aims to convey opportunity and priority, focus attention and activity, improve targeting and effectiveness, introduce accountability, identify what works, and help celebrate progress and motivate action to address shortfalls.

Contributions. Measurement has been at the heart of every major strategic health and health care improvement initiative, ranging from childhood immunization and high blood pressure control, to reducing tobacco use and heart attack deaths, improving the safety and effectiveness of medical and surgical services, and advancing air and water quality.

Challenges. As measurement has expanded with the growth of insights, tools, and programs, problems have emerged to limit its usefulness—lack of stan-

BOX S-3 Continued

standardization, poor comparability, sporadic availability, and marginal institutional relevance. In addition, the large number of measures risks directing attention narrowly rather than to issues with broader-based overall impact.

Measurement burden. Meeting measurement and reporting requirements from different organizations, with sometimes parochial reference points and motives, has added administrative burdens that can be both expensive and clinically distracting, without concomitant return to the effectiveness, efficiency, or pace of health and health care improvement.

Core measure advantages. A parsimonious set of measures that is standardized, timely, available at multiple levels, and focused on issues most important to better health and health care, for individuals and the population—vital signs—will help drive attention to and action on those issues, reduce the need for many measures currently collected, and provide a stable anchor and reference point for improving the reliability and utility of measurement broadly.

Core measure content. The core measure set represents a blend of discrete and composite measures of health status and health determinants (personal, behavioral, social, and environmental risks), health care quality, cost and affordability, and individual and community initiative for better health. The set includes both process and outcome measures whose commonality is their ability to reflect issues with broad impact.

Composite measures. Certain core measures are intended to be composites developed from individual elements collected discretely and reported in the aggregate to express how a family of condition-specific measures better reflects systemic performance than the individual measures. The whole is greater than the sum of the parts, and considering only the individual parts can obscure broader insights.

Relation to other measures. Application of core measures across the health and health care stakeholder communities can offer important advantages to other measurement activities by fostering more standardization, providing reliable reference points in the analysis of other data, improving reliability of trials and registries, and building patient and public familiarity and confidence in measurement. Over time, with increasing experience on the capacity of core measures to trigger broader change, some of the measures can be retired.

Committee limits. With the range and complexity of issues to be considered, no single group can, on its own, contain the necessary expertise to specify each measure's details. The committee has identified the core set, but directly involved stakeholders are needed to specify the detailed features of the discrete standardized measures, the calculation of the composites, the field testing and refinement, and their implementation.

no single sector acting alone can bring about the transformative change needed to align and focus the measurement enterprise. Each sector faces different measurement challenges, has different roles and opportunities, and is accountable for different aspects of the system's progress, but they all depend on the critical preconditions for success—leadership, strategy, alignment of incentives, infrastructure, culture, and continuous learning. Box S-4 presents the Committee's recommendations.

BOX S-4 **Committee's Recommendations**

The Nation

Recommendation 1: The parsimonious set of measures identified by the Committee should be widely adopted for assessing the state of America's health and health care and the nation's progress toward the goal of better health at lower cost.

All People—as Individuals, Family Members, Neighbors, Citizens, and Leaders

Recommendation 2: All people should work to understand and use the core measure set to assist in taking an active role in shaping their own health prospects and those of their families, their communities, and the nation.

The Federal Government

Recommendation 3: With the engagement and involvement of the Executive Office of the President, the Secretary of the U.S. Department of Health and Human Services (HHS) should use the core measure set to sharpen the focus and consistency and reduce the number and burden of measure reporting requirements in the programs administered throughout HHS, as well as throughout the nation. To this end, the Secretary should incorporate the standardized core measure set into federally administered programs, concomitantly eliminating measures for which the basic practical issues are engaged by the core set:

- HHS's national agenda frameworks for health, including the National Quality Strategy and the National Prevention Agenda;
- the Meaningful Use Program, administered by the Centers for Medicare & Medicaid Services (CMS) and the Office of the National Coordinator (ONC), to ensure that the core measure set becomes a central element of every electronic health record;

BOX S-4 Continued

- CMS's accountable care organization measurement and reporting requirements;
- CMS's strategies for promoting quality improvement and innovation in health care financing and delivery through the work of the Center for Medicare & Medicaid Innovation;
- federal health care reporting requirements;
- streamlined reporting requirements under state Medicaid waiver authority; and
- categorical health grant program management.

Recommendation 4: With the engagement and involvement of the Executive Office of the President, the Secretary of HHS should develop and implement a strategy for working with other federal and state agencies and national organizations to facilitate the use and application of the core measure set. This strategy should encompass working with

- the Secretary of the U.S. Department of the Treasury on use of the core measure set by tax-exempt hospitals and health systems in demonstrating their community benefit contributions;
- other Cabinet departments in administration of their health-related activities—for example, in social services, the environment, housing, education, transportation, nutrition, and parks and recreation;
- state and local governments and voluntary organizations in adapting use of the core measures to their needs and circumstances; and
- multiple stakeholders through the Center for Medicare & Medicaid Innovation in piloting implementation of the core measures through multilevel stakeholder initiatives.

Recommendation 5: The Secretary of HHS should establish and implement a mechanism for involving multiple expert stakeholder organizations in efforts to develop as necessary, maintain, and improve each of the core measures and the core measure set as a whole over time. The Secretary's role should encompass stewardship of work on

- national standardization of the best current measures and related priority measures detailed in this report;
- development of the longer-term measures necessary to improve the utility and generalizability of the core measures;
- national standardization of reporting on health disparities for each of the core measures, including disparities based on race, ethnicity, gender, and socioeconomic status;
- periodic review and revision of the individual measures in response to changing circumstances; and

continued

BOX S-4 Continued

- periodic review and revision of the core measure set in response to changing circumstances.

Governors, Mayors, and Health Leaders

Recommendation 6: Governors, mayors, and state and local health leaders should use the core measure set to develop tailored dashboards and drive a focus on outcomes in the programs administered in their jurisdictions, and they should enlist leaders from other sectors in these efforts.

Clinicians and Health Care Delivery Organizations

Recommendation 7: Clinicians and the health care organizations in which they work should routinely assess their contributions to performance on the core measures and identify opportunities to work collaboratively with community and public health stakeholders to realize improvements in population health.

Employers and Other Community Leaders

Recommendation 8: Employers and other community leaders should use the core measures to shape, guide, and assess their incentive programs, their purchasing decisions, and their own health care interventions, including initiatives aimed at achieving transparency in health costs and outcomes and at fostering seamless interfaces between clinical care and supportive community resources.

Payers and Purchasers

Recommendation 9: Payers and purchasers of health care should use the core measures to capture data that can be used for accountability for results that matter most to personal and population health, to refine the analytics involved, and to make databases of the measures available for continuous improvement.

Standards Organizations

Recommendation 10: Measure developers, measure endorsers, and accreditors, such as the National Quality Forum (NQF), the National Committee for Quality Assurance (NCQA), and the Joint Commission, should consider how they can orient their work to reinforce the aims and purposes of the core measure set, and should work with the Secretary of HHS in refining the expression and application of the core measure set nationally.

Leadership is key at every level. In addition to the federal government, leadership on implementation of the core measure set will be required at other levels of the health system, including the community, county, and state levels, as well as within health stakeholder groups. While the core measures themselves represent a standard approach to measuring valued outcomes, achieving the required level of data reporting and use will present different challenges for different groups. A thoughtful planning process with broad input from relevant parties could support successful implementation by ensuring that responsibilities, challenges, and gaps are addressed early, and potential barriers are identified.

Incentives will need to be realigned. Many of the forces and incentives at play in the health system today are directed toward proxies or processes related to health care rather than toward the outcomes they are intended to influence. For example, fee-for-service models of care delivery incentivize the health care system to provide a high volume of services, although higher service volume does not necessarily equate to better outcomes or better quality.

Similarly, more measures do not necessarily equate to better outcomes or better quality. A strong effort is needed to reduce the number, sharpen the focus, and improve the comparability of measures. The widespread application of a limited set of standardized measures that reliably captured system outcomes would reduce the need for process measures in many instances. Moreover, core measures could be used to help better align the incentives and actions of multiple organizations at multiple levels: if they were striving for the same results, their activities would be more likely to align, or if they differed, would create natural experiments with which to assess the value of alternative routes to the same goals. But this opportunity for alignment must start with the existence of well-accepted, sound core measures of commonly sought outcomes.

Success also will require robust, interoperable infrastructure for routinely collecting and reporting key data elements. While in the short term, core measures at different levels of the health system can be assembled from unconnected data systems and with varying levels of detail and coverage, in the long term, core measures can drive advances in infrastructure development and interoperability around those measures that are of the highest priority for understanding and measuring progress in the health system. The motivation to take such steps will depend on how well the core measures—and the approaches taken to their implementation—accord with the culture and priorities of a stakeholder group or community. In particular, the core measures may meet with resistance if presented as a tool for assigning accountability or for assessing pay based on performance. Successful implementation of the core measures will depend on the ability of local leaders to

account for cultural factors that may present challenges and to ensure that the approach to implementation is tailored to cultural norms and priorities.

Finally, as noted earlier, the core measures are not intended to be static, but are expected to evolve over time, keeping pace with the needs and capabilities of the health system. Therefore, a continuous learning approach to implementation, emphasizing the dynamic nature of the measures and the implementation process, can ensure that the core measures will serve as a sustained and reliable guide to and prompt for improvement and progress through decades to come.

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1

Introduction and Overview

In times of rapid change and constrained resources, progress depends on the ability to focus attention on the outcomes that matter most. Progress in any endeavor is a product of an understanding of the current state, the tools available for addressing challenges, and the resolve to take the actions required. Basic to each is the choice of measures—measures that give the best sense of progress, measures that guide actions, and measures that can be used to gauge impact.

For Americans today, health care costs and expenditures are the highest in the world, yet health outcomes and care quality are below average by many measures (OECD, 2013). If health expenditures are to be brought into alignment on behalf of better health and lower costs, keen attention and decisive actions will be required of all stakeholders—health professionals; payers; policy makers; and all individuals as patients, family members, and citizens—on what matters most. That is the focus of this report. What matters most for health and health care? What are the vital signs for the course of health and well-being in America?

Accurate information about health and health care enables success to be accurately defined, and it draws attention to gaps and shortfalls in need of attention. But the existence of too many measures can limit effectiveness. No single, objective measure set exists for the state or the priorities of the nation's health and health care system. Rather, thousands of different measures are used to assess intermediate aspects or qualities of the four key domains of influence on health and well-being that helped frame this study—healthy people, care quality, care costs, and people's engagement in health and health care—from emergency room wait times, to blood

pressure, to out-of-pocket costs, to life expectancy. Because standardized action-anchoring measures are relatively rare, the numerous measurements taken often are overlapping or redundant. One result is a diffusion of focus. Moreover, as the number of available measures continues to grow without concomitant gains in health outcomes, responsibilities for assessing, measuring, and reporting can become a burden in terms of cost, time, and efficiency, with marginal benefit (Meltzer and Chung, 2014). Identifying and prioritizing the most powerful of these myriad measures at each level of activity—establishing core measures—can enable the health system to work in a coordinated fashion toward a shared vision of America’s health future. Box 1-1 previews and summarizes some of the compelling issues that the Institute of Medicine (IOM) Committee responsible for this report identified and sought to address in the course of its work.

The implementation of core measures will depend on a culture of shared accountability for health. Responsibility for improving the nation’s health outcomes must be assumed by all members of the multisectoral health system, defined broadly to include the full array of sectors and entities—from clinicians and hospitals to schools and families—that influence the health of the population through their activities (IOM, 2012b). By garnering the attention of all stakeholders involved in the health system, measurement activities can be coordinated and redirected toward those outcomes that are most meaningful to all.

BOX 1-1

Committee Framing Perspectives

Measurement aims. Measurement aims to convey opportunity and priority, focus attention and activity, improve targeting and effectiveness, introduce accountability, identify what works, and help celebrate progress and motivate action to address shortfalls.

Contributions. Measurement has been at the heart of every major strategic health and health care improvement initiative, ranging from childhood immunization and high blood pressure control, to reducing tobacco use and heart attack deaths, improving the safety and effectiveness of medical and surgical services, and advancing air and water quality.

Challenges. As measurement has expanded with the growth of insights, tools, and programs, problems have emerged to limit its usefulness—lack of standardization, poor comparability, sporadic availability, and marginal institutional

BOX 1-1 Continued

relevance. In addition, the large number of measures risks directing attention narrowly rather than to issues with broader-based overall impact.

Measurement burden. Meeting measurement and reporting requirements from different organizations, with sometimes parochial reference points and motives, has added administrative burdens that can be both expensive and clinically distracting, without concomitant return to the effectiveness, efficiency, or pace of health and health care improvement.

Core measure advantages. A parsimonious set of measures that is standardized, timely, available at multiple levels, and focused on issues most important to better health and health care, for individuals and the population—vital signs—will help drive attention to and action on those issues, reduce the need for many measures currently collected, and provide a stable anchor and reference point for improving the reliability and utility of measurement broadly.

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Committee limits. With the range and complexity of issues to be considered, no single group can, on its own, contain the necessary expertise to specify each measure's details. The committee has identified the core set, but directly involved stakeholders are needed to specify the detailed features of the discrete standardized measures, the calculation of the composites, the field testing and refinement, and their implementation.

MEASUREMENT IN HEALTH AND HEALTH CARE

The health and health care landscape in the United States is changing markedly for reasons that extend far beyond recent health care reform legislation, including an aging population, new science and technology, personalized medicine, shifts in the roles and perspectives of patients and clinicians, new payment models, and unsustainable costs. As a result, initiatives are under way throughout the country to promote the health of the population, improve health care quality, reduce health care costs, and engage people and communities in their health and health care. Finding the best ways to assess the results of these initiatives has become a major focus of tracking and improvement efforts, with payers collecting and analyzing claims data, hospitals tracking care quality, patients monitoring their own health through mobile apps, and public health agencies recording population-wide trends.

The need for change is further motivated by inconsistencies in overall health system performance. Multiple technological advances, including innovative imaging and diagnostic tools, new interventions for chronic disease, and new personalized treatment plans, have emerged in the health system. Yet the system is also characterized by shortfalls with respect to what is possible. Americans' life expectancy and overall health tend to be poorer than in peer countries; the quality and safety of health care vary significantly across communities, regions, and states; health care is guided insufficiently by available evidence; and increases in health care costs generally have outpaced the nation's economy (IOM, 2012a; McGlynn et al., 2003; NRC and IOM, 2013; OECD, 2013). The combination of these major challenges necessitates a new approach to monitoring progress and understanding whether reforms are leading to their expected results at the national, state, regional, community, and organizational levels.

A dominant feature of the health system is its fragmentation, and that fragmentation is reflected in the measures currently in use. Because of the great number and variety of organizations requiring information for claims, program performance, safety, and quality assurance purposes, the total number of health and health care measures in use today is unknown. Nonetheless, reference points such as the Centers for Medicare & Medicaid Services (CMS) Measure Inventory, which catalogs the nearly 1,700 measures in use by the U.S. Department of Health and Human Services (HHS), indicate that they number in the thousands (CMS, 2014). The National Quality Forum's (NQF's) measure database includes 620 measures with current NQF endorsement. The National Committee for Quality Assurance's (NCQA's) Healthcare Effectiveness Data and Information Set (HEDIS), used by more than 90 percent of health plans, comprises 81 different measures. And in 2010, the Joint Commission required hospitals

to provide data for measures selected from a set of 57 different inpatient measures, 31 of which were publicly reported at the time (Chassin et al., 2010). The measurement initiatives and reporting requirements included in Appendixes A and B, respectively, provide a sense of the range and diversity of measures in use today.

While many of these measures are of high quality and provide valid and useful information about health and health care, many examine only slight variations of the same focus. Furthermore, although many of the measures in use today are similar enough to serve the same purpose, they also differ enough to prevent direct comparison among the various states, institutions, or individuals interested in the same focus. The causes and consequences of this variability are explored in Chapter 2.

Data Gathering Efforts

The current measurement enterprise is characterized by multiple initiatives across the many dimensions of the health system, with little alignment of measures or goals. Given the proliferation of measures in play, a key challenge is harmonizing and aligning measurement programs to minimize redundancies and unnecessary customization (Hussey et al., 2009; IOM, 2006; NQF, 2013; Wold, 2008). The collection and analysis of measures require significant effort, time, and resources; therefore, it is important to ensure that measurement produces the maximum amount of information for the least amount of investment in resources. Similarly, significant opportunity costs are entailed in devoting resources to inefficient, redundant, or poorly specified measurement activities, which can displace other valuable opportunities to improve health and health care. The appendixes of this report provide widely ranging examples of measurement activities, reporting requirements, and data sources that support measurement of different aspects of the health system. Yet while more than 27 organizations, 36 programs, and 1,235 individual measures are identified, they represent only a portion of the measurement activities under way.

In addition to the sheer number of measures, another challenge lies in their focus. Many measurement programs limit their focus to narrow or technical components of health care processes instead of targeting outcomes. Health care measures also often fail to capture the multiple factors that lie outside the domain of the traditional health care system but represent the most important influences on health (IOM, 2011b, 2013b; Kindig and Stoddart, 2003; McGinnis and Foege, 1993; McGinnis et al., 2002). Without understanding these factors, it will be difficult to make sustainable progress toward improving the health of the nation.

Measurement Requirements

An increasing number of organizations require health care providers and others to report data on a variety of measures. These contractual requirements range from long-standing government programs, such as the reporting of vital statistics, to requirements related to specific programs, such as the Medicare Shared Savings Program for accountable care organizations (ACOs) or incentive payments for the Physician Quality Reporting System (PQRS). Reporting requirements often are aimed at assessing similar features and targets, such as readmission rates or costs of care, but with differently structured and implemented measures. As a result, hospitals and other health care organizations often are required to report redundant and overlapping measures, which imposes an additional time and resource burden. A detailed overview of major reporting requirements and their similarities and differences is provided in Appendix B.

Despite the call by organizations such as NQF and HHS for greater alignment and harmonization in health system measurement, the various measurement efforts remain broadly uncoordinated both horizontally, or across various activities, and vertically, in terms of consistent and comparable measurements at the national, state, local, and institutional levels. The Committee believes that renewed attempts to align and harmonize measures to reduce redundancies and inefficiencies may now succeed because of the significant changes that have occurred in the environment for measurement. Notably, data capture capabilities have grown rapidly, with electronic health records and other digital tools seeing increasingly widespread use (IOM, 2011a). The emerging health information technology infrastructure could support a real-time measurement system for the routine collection of information about care processes, patient needs, progress toward health goals, and individual and community health outcomes. The transformation of technology and capacity provides an opportunity to measure what matters most, enabling goals to drive measures rather than measures driving goals.

BETTER HEALTH AT LOWER COST: DOMAINS OF INFLUENCE

At the most basic level, the targets and outcomes of interest for measurement are those that reflect the greatest potential for the health and well-being of the population and each individual within it, now and in the years to come. This potential is shaped by the four key domains of influence noted above: healthy people, care quality, care costs, and people's engagement in health and health care.

Healthy People

The foundational motivation of this report, and of the health system at large, is improving the health of individuals, communities, and the nation. From a population health perspective, the United States faces significant challenges, with chronic disease afflicting nearly half of all adults, violence and injury being the leading cause of death for people aged 1 to 44, and childhood obesity—a harbinger of poor health in adulthood—affecting 17 percent of America’s children (CDC, 2012; Ogden et al., 2014; Ward and Schiller, 2013). From an international perspective, the United States is below average on a range of health measures. The nation spends nearly twice the OECD average on health, yet Americans have a life expectancy of 78.7 years, below the OECD average of 80.2 years (OECD, 2013). The National Research Council (NRC)/IOM report *U.S. Health in International Perspective: Shorter Lives, Poorer Health* provides a broad look at the state of the nation’s health in comparison with other nations (NRC and IOM, 2013). A key finding in that report is that Americans fare worse than other developed nations in at least nine health areas: infant mortality and low birth weight, injuries and homicides, adolescent pregnancy and sexually transmitted infections, HIV and AIDS, drug-related deaths, obesity and diabetes, heart disease, chronic lung disease, and disability. Among the contributors to this American disadvantage are limitations in access to care, disparate quality of care delivered by the nation’s health systems, risky health behavior profiles, and socioeconomic disparities (NRC and IOM, 2013).

The U.S. health system is marked by significant challenges beyond the delivery of care in hospitals or provider offices. Such factors as socioeconomic status, behavior, environment, and health literacy have important implications for the health of individuals and communities. It is estimated that in the United States, 10 to 15 percent of preventable mortality is amenable to health care interventions, while approximately 40 percent of preventable deaths are attributable to behavior patterns that could potentially be modified (McGinnis et al., 2002). Paradoxically, it is estimated that 95 percent of U.S. spending on health goes to direct provision of health services, with the remaining 5 percent being spent on public health (McGinnis et al., 2002). While spending on health care is significantly higher in the United States than in other developed countries, the nation spends less, as a proportion of total spending, on public health and social programs that address those aspects of health outside of clinical care (Bradley et al., 2011). The IOM report *For the Public’s Health: Investing in a Healthier Future* explores in detail the state of America’s public health system and financing, and presents a case for reformulating the nation’s portfolio of health investments to focus more resources on public health and prevention as a

step toward improving health and reducing health care costs in the United States (IOM, 2012b).

Care Quality

A major impetus for transforming the measurement enterprise is the uneven performance of the health system, which is characterized by islands of excellence existing alongside areas in need of improvement. On the one hand, significant advances have been made in improving the public health. During the 20th century, life expectancy increased by nearly 60 percent (Guyer et al., 2000), while the mortality rate has declined by more than 60 percent over the past 75 years (Hoyert, 2012). Clinical care also has seen marked progress, including vaccines that have virtually eliminated many childhood infectious diseases; antibiotic therapies for infectious diseases; multiple interventions for cardiovascular disease, from beta blockers to percutaneous coronary intervention (PCI) and coronary artery bypass grafting; and cocktails of pharmaceutical agents tailored to the specific genetic characteristics of HIV, a microbe identified just 30 years ago (Fauci, 2003; FDA, 2011; Fischl et al., 1987; IOM, 2012a; Nabel and Braunwald, 2012; Simon et al., 2006).

At the same time, the system has compelling needs for improvement. A decade ago, in the report *To Err Is Human: Building a Safer Health System*, the IOM estimated that 44,000 to 98,000 people died in hospitals every year as a result of preventable medical errors (IOM, 1999). Medical errors remain common, occurring in almost one-third of hospitalized patients (Classen et al., 2011; Landrigan et al., 2010; Levinson, 2010, 2012). One recent analysis suggests that preventable harm may lead to more than 200,000 deaths per year (James, 2013). In addition, applicable research and evidence are not integrated routinely into direct patient care, with Americans receiving only about half of the care recommended by current evidence (McGlynn et al., 2003) and with a lag of years or even decades in the application of new evidence to current health practice (IOM, 2012a).

The care system also faces significant challenges in terms of access to care, with many Americans encountering limitations due to cost, transportation, wait times, and other factors that can impede their ability to receive the care they need at the right time and place. Relatedly, the care received often is limited in the extent to which it meets and accounts for the needs, priorities, and perspectives of patients.

Health care also has become increasingly complex, resulting in short-cuts in decision making and clinical processes, fragmentation of care, preventable errors, and a lack of accountability. Moreover, the health care system is characterized by inefficiencies in spending and resource use, such that an estimated 30 percent of health care spending is wasted. The 2012

IOM report *Best Care at Lower Cost* explores the causes and consequences of shortfalls in health care quality and outlines approaches for addressing them (IOM, 2012a).

Care Costs

The relative underperformance of the health system with respect to population health and health care quality has coincided with growth in health care costs that has vastly outpaced the rest of the economy, highlighting the lower levels of productivity being achieved by the health system (IOM, 2010, 2012a). Health care costs now constitute almost a fifth of the nation's economy (Hartman et al., 2013) and pose a challenge for the budgets of the federal and state governments, businesses, and families. Costs vary significantly and with little correlation with quality among different regions of the country, states, localities, and even clinicians operating in the same practice (IOM, 2013c). Health care expenditures sometimes are only coincidentally related to care outcomes.

The costs of health care in the United States for individuals, states, and the nation pose significant challenges for the accessibility and affordability of care and raise questions as to whether the care being purchased is worth the investment. Growth in aggregate health care costs challenges the competitiveness of U.S. companies and reduces take-home pay for working Americans. High out-of-pocket costs place financial pressure on individuals and families, potentially leading people to avoid or delay care or to ration personal care resources by, for example, taking medications less frequently than prescribed (Goldman et al., 2004). Health care also is a significant source of debt for many Americans (Doty et al., 2005), while health care costs are the major contributor to growth in the national debt. And demands placed on state and national budgets by health care costs may drive down investment in other critical areas impacting health, including education and the environment (McCullough et al., 2012). Although some recent trends in health care costs have been encouraging, with the pace of increases remaining lower than expected, the precise cause of this effect and whether it will continue over time are unclear (Blumenthal et al., 2013; Cutler and Sahni, 2013; Ryu et al., 2013).

Moving forward, how will the nation know whether its investments in the health care system are improving health and yielding a higher quality of life for its citizens? While the current measurement system evaluates many aspects of health care delivery, little attention is paid to measurement of the “value” of health care—better health outcomes per unit cost. No single measure of value exists, and improvements in quality or outcomes and in cost often are measured using different scales. In the absence of quality information, people tend to equate higher cost with higher quality. Moreover,

different people may assign different weight to various aspects of quality—for example, expected mobility versus length of recovery time or anticipated risk. Information should enable care choices and treatment that best match individual priorities. From a consumer perspective, therefore, price is a poor indicator of quality and, by extension, not a useful data point for choosing among services or providers. Unlocking the power of the demand side—people, patients, employers, families, and government programs—to drive progress in the health system will depend on the provision of meaningful, accurate, and comparable information about value.

People's Engagement in Health and Health Care

In the context of legislative and payment reforms, changes in technology and access to information, new models of care delivery, and links between progress in chronic disease and patient initiative, patients, consumers, and the broader public are playing an increasing role in health and health care. Evidence suggests that people who are more actively involved with their health and health care may have improved outcomes. Research has found that people who use health-related social networking sites, such as PatientsLikeMe, TuDiabetes, and TheBody, have improved treatment adherence and a better understanding of their medical condition and feel more in control of their disease management (Grajales et al., 2014). One survey conducted in partnership with *Consumer Reports* found that American social media users have a high level of interest in sharing their personal data to improve the evidence base, assuming adequate privacy protections are in place. Fully 94 percent of people participating in the survey reported being willing to share their health data to help doctors improve care (Grajales et al., 2014).

Importantly, the concept of engagement pertains both to individuals and to the community. Individuals and communities share responsibility for maintaining and promoting the health of individuals and populations. Effective engagement is built on public understanding of the determinants of health. Similarly important is that determinants of health be reflected in public agendas for health improvement, which demonstrate the extent of a community's commitment to addressing the population-wide factors in the community that shape people's health, health care, and health prospects. While the evidence base is still evolving in this domain as it is in the domains of healthy people, care quality, and care costs, an effective strategy for marshaling greater individual and public engagement in health and health care is needed.

CHALLENGES TO MEANINGFUL MEASUREMENT

Ironically, the rapid proliferation of interest, support, and capacity for new measurement efforts for a variety of purposes—including performance assessment and improvement, public and funder reporting, and internal improvement initiatives—has blunted the effectiveness of those efforts. This situation reflects in part the fragmentation of the health care sector, as well as the range of legislatively mandated activities that involve measurement of health and health care. Absent a shared strategy, the variation inherent in thousands of disconnected measurement and accountability systems frustrates understanding of health system performance and the accomplishment of shared goals.

The Changing Measurement Landscape

Rapid change in the organizational and payment landscapes for health care has introduced new measurement responsibilities. Moreover, the introduction of multiple new models for delivering, paying for, and organizing health care has coincided with new initiatives to improve personal and population health. Developments range from ACOs, insurance marketplaces, and value-based payment programs to regional and community health improvement collaboratives. These new models and initiatives are not adequately supported by current assessment capabilities; better measurement tools are needed to support their operations and capture their successes (Schneider et al., 2011). Furthermore, the lack of alignment and comparability in the current measurement landscape limits the capacity to make meaningful comparisons among approaches or solutions and, by extension, may limit the spread of best practices and solutions for widely shared health system challenges.

Increasingly Burdensome Measurement Requirements

Tremendous growth in the development and use of measurement in the health system has led to a large number and variety of measures that, although in many cases of high quality, may create significant areas of overlap or redundancy. Health care organizations report rapidly growing requirements for the devotion of staff time and money—particularly clinician time—for measurement requirements of marginal utility in improving care and outcomes (Meyer et al., 2012). The burden of so many measurement activities and requirements can have negative consequences in terms of both the real cost of inefficiency in data collection and reporting and the opportunity costs associated with excessive spending on measurement. The growth of the measurement burden is discussed in greater detail in Chapter 2 as a key challenge for health and health care measurement.

A Blurred Focus on Priority Issues

New knowledge, alternative care delivery vehicles, the development of new incentive approaches for providers, expanded public input, and other factors are intersecting to drive rapid change in the health system. Most of these changes, however, occur in an independent and uncoordinated fashion, and the introduction of each new measure for assessing their results and outcomes tends to diffuse the ability to focus on what is most important. Fragmentation of the system leads to fragmentation of solutions, with different stakeholder groups and institutions working toward different goals with different tools and measures. For example, one study found that more than 30 percent of measures surveyed were either modifications of existing measures or homegrown, with 80 percent of programs modifying at least one measure and 40 percent of programs creating at least one new measure (Bazinsky and Bailit, 2013). This lack of coordination blurs focus, at every level, on the priority issues and outcomes with the greatest potential to improve health.

Lack of Standardization in Measuring Similar Concepts

The growth over the past decade in measures that health care organizations are required to report is due in part to redundancies and inefficiencies in data collection and measure specification, such that different organizations interested in assessing the same target or feature require different measures with different specifications. For example, one study found that across six HHS measurement programs, 61 different measures were in use for smoking cessation, 113 for HIV, 19 for obesity, and 68 for perinatal health (HHS, 2014). The result is a health measurement system that lacks standardization for the assessment and reporting of data on commonly assessed concepts.

Need for a Core Measure Set

A set of core measures is needed to promote improved health and health care. As defined in Box 1-2, core measures, for present purposes, consist of a parsimonious set of measures that provide a quantitative indication of current status on the most important elements in a given field, and that can be used as a standardized and accurate tool for informing, comparing, focusing, monitoring, and reporting change. A core measure set is not intended to replace the full range of measures in use today, rather, it is intended to enhance the focus of central health care actors on critical goals and routes toward those goals. A core measure set has the potential to accelerate improvement by concentrating attention, reducing inefficiency,

BOX 1-2
Definition of Core Measures

A parsimonious set of measures that provide a quantitative indication of current status on the most important elements in a given field, and that can be used as a standardized and accurate tool for informing, comparing, focusing, monitoring, and reporting change.

making reporting more powerful, and promoting innovation in measurement and care. In other words, a well-designed core measure set can lead to better health care at lower cost.

As detailed above, while the ability to measure discrete processes and features in health care has grown increasingly sophisticated, the availability of measures and data to enable direct comparisons of broader health outcomes and circumstances at the national, state, county, community, and institutional levels is a persistent challenge. Core measures present an opportunity to improve the nation's ability to measure and improve performance on health, health care, affordability, and engagement by providing common points around which activities can be oriented and outcomes compared. By virtue of their central nature, core measures can drive improvements that will have a ripple effect on performance throughout the system; that is, if stakeholders align around a common set of well-designed measures, attention to improvement on those measures can lead to system-wide performance enhancement. The existence of a parsimonious core measure set also can free institutions to direct additional measurement focus and resources to issues tailored to their particular circumstances.

Relevance to Diverse Health Care Roles and Circumstances

To serve their purpose of focusing attention on overriding health care and health goals, core measures must be broad-based and high-level; they cannot, by definition, capture the particular concerns and perspectives of each actor in the health system, regardless of the validity and compelling nature of those interests. Nevertheless, the Committee believes that core measures are relevant to the work of virtually all stakeholders involved in advancing the health and health care of individuals and communities nationwide, even where the work of those actors is quite specialized and may call for legitimate, complementary measure sets. Specialists in allergy and immunology, for example, may not immediately see their primary service

activity directly reflected in the core measure set. However, their work is directly related to, and affected by, the profiles of their patients with respect to issues like well-being, healthy communities, preventive services, care access, evidence-based care, care math with patient goals, personal spending burden, and individual engagement.¹ Furthermore, a core measure set that includes indicators of community health may focus the attention of these providers on the environmental and cultural factors that can so heavily influence the burden of allergic and immunologic illness among their patients. This awareness, in turn, can foster the sense of a professional opportunity to help address those community-wide influences. The process used to implement core measures must account for the requirement to make these translations into terms relevant to the many diverse health care actors.

In many cases, core measures may also need to be translated in ways that reveal their relevance and utility for actors at different levels of the health care system. For example, while the proportion of gross domestic product devoted to care provides a national view of health care spending, the concept of population spending burden is pertinent at the state, local, and institutional levels. At the state and local levels, the burden of health care spending could be compared against overall budgets or economic output, or spending levels could be assessed relative to peer states or to a performance benchmark. At the level of health care institutions, for example, the measure of total cost of care and resource use could provide actionable information on spending in the context of providing care services.

STUDY CHARGE AND APPROACH

Study Charge

To address the increasingly urgent need for a framework, measures, and principles around which the nation might transform the efficiency, effectiveness, and utility of the health and health care measurement enterprise, the IOM, with the support of three sponsoring organizations—Blue Shield of California Foundation, the California HealthCare Foundation, and the Robert Wood Johnson Foundation—appointed the Committee on Core Metrics for Better Health at Lower Cost. The charge to the Committee, presented in Box 1-3, was essentially to articulate basic measurement needs focused on what matters most across all levels of the health system; identify a parsimonious set of core measures in those areas; describe how these core measures should relate to, shape, and enhance broader measurement efforts throughout the health system; and suggest strategic approaches

¹ This sentence is an elaboration on that presented in the version originally released in prepublication format.

BOX 1-3
Charge to the IOM Committee on Core Metrics
for Better Health at Lower Cost

An ad hoc committee will conduct a study and prepare a report directed at exploring measurement of individual and population health outcomes and costs, identifying fragilities and gaps in available systems, and considering approaches and priorities for developing the measures necessary for a continuously learning and improving health system. The Committee will:

- consider candidate measures suggested as reliable and representative reflections of health status, care quality, people's engagement and experience, and care costs for individuals and populations;
- identify current reporting requirements related to progress in health status, health care access and quality, people's engagement and experience, costs of health care, and public health;
- identify data systems currently used to monitor progress on these parameters at national, state, local, organizational, and individual levels;
- establish criteria to guide the development and selection of the measures most important to guide current and future-oriented action;
- propose a basic, minimum slate of core metrics for use as sentinel indices of performance at various levels with respect to the key elements of health and health care progress: people's engagement and experience, quality, cost, and health;
- indicate how these core indices should relate to, inform, and enhance the development, use, and reporting on more detailed measures tailored to various specific conditions and circumstances;
- identify needs, opportunities, and priorities for developing and maintaining the measurement capacity necessary for optimal use of the proposed core metrics; and
- recommend an approach and governance options for continuously refining and improving the relevance and utility of the metrics over time and at all levels.

to implementation. The ultimate goal of the Committee's work was to spur widespread improvement in health and health care through a more aligned and efficient measurement system. The breadth of the Committee's charge reflected the extent of opportunities to achieve this goal.

Study Approach

The Committee convened to carry out this study comprised 21 individuals with a broad range of expertise, including health economics and policy, population health, health care delivery and safety net populations,

state and community health improvement, health measurement, and information technology and data infrastructure, as well as individuals who understand the perspectives of health care payers and purchasers, clinicians, researchers, and patients and consumers. Committee members' biographies are presented in Appendix E.

Recognizing that success depends on concerted actions by all stakeholders in the system, the Committee sought input and feedback from a broad range of individuals and organizations. Staff contacted 126 leading health organizations to solicit their thoughts on the current state of measurement, challenges limiting its potential, and opportunities that could be transformative. The resources received from these organizations informed the Committee's deliberations on the needs and opportunities in the field. The Committee also held open sessions at three of four of its meetings, during which stakeholders and practitioners from various organizations with ties to health and health care measurement—such as NQF, NCQA, CMS, the Agency for Healthcare Research and Quality (AHRQ), the Centers for Disease Control and Prevention (CDC), and the Office of the Secretary of HHS—provided additional perspective and background. Organizations representing patient and consumer perspectives also provided important input for these discussions.

The Committee deliberated during four in-person meetings and multiple conference calls over 2013 and 2014. The Committee's overarching approach to identifying core measures is illustrated in Figure 1-1. Its initial deliberations focused on clarifying the scope of the study and gathering input, while later meetings focused on synthesizing conclusions and formulating recommendations that would move measurement forward. To accelerate its efforts, the Committee drew on related IOM work described below, particularly an earlier IOM workshop on the core measurement needs for better care, better health, and lower costs (IOM, 2013a). Furthermore, staff and Committee members reviewed the evidence related to measurement and

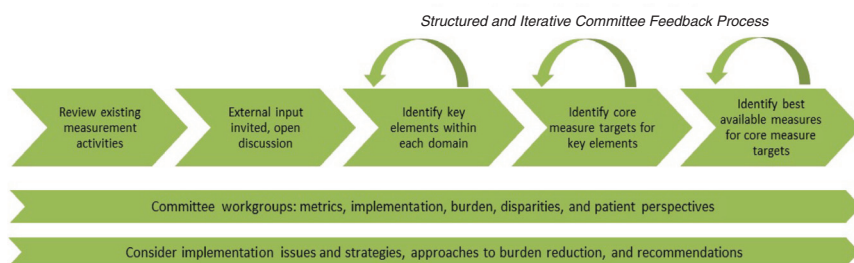


FIGURE 1-1 The Committee's approach to identifying the core measure set.

case studies of measurement initiatives to inform the findings, conclusions, and recommendations presented in this report.

This report references and builds on the work of a wide range of other individuals and organizations devoted to addressing the nation's changing health and health care measurement needs. These include activities stewarded through the HHS Secretary, the Secretary's Prevention Agenda and *Healthy People* Leading Health Indicators, the National Quality Strategy, the Joint Commission, the Institute for Healthcare Improvement, and the organizations mentioned above (CMS, CDC, AHRQ, NQF, and NCQA). These and other measurement activities are discussed in Chapter 2.

RELATED WORK OF THE INSTITUTE OF MEDICINE

The IOM has produced several reports aimed at strengthening the focus of the national health agenda on matters of compelling urgency. These reports have explored approaches to measurement activities ranging from specific assessments of the needs for health care and public health to surveys that cut across the entire health system. In so doing, these reports have drawn attention to the gaps in the nation's measurement capabilities and outlined opportunities for improvement.

At various levels, the present report draws on the broader foundation of the IOM work articulating a vision and strategy for improving health and the health care system. The 1999 report *To Err Is Human: Building a Safer Health System* and the 2001 report *Crossing the Quality Chasm: A New Health System for the 21st Century* together highlight some of the most significant challenges facing the health system and outline a potential path forward in terms of governance, health practice, and health culture (IOM, 1999, 2001). Those reports galvanized the nation's attention to focus on the deficiencies in health care and the importance of engaging them directly.

Also related is the work of the IOM Roundtable on Value & Science-Driven Health Care in bringing together the nation's health leaders with the common purpose of accelerating achievement of the health system's full potential. The 12-volume *Learning Health System* series produced under the Roundtable includes discussion and ideas from a series of 15 workshops covering issues that range from research and technology infrastructure to leadership to patient engagement.

More recently, the 2012 IOM report *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America* was issued. This report charts opportunities for marshaling advances in science and technology, as well as the market forces of increased public and patient involvement, to drive the health system toward the culture and practice of real-time and continuous improvement in the effectiveness and efficiency of care (IOM,

2012a). The present report outlines what steps are necessary and possible to track the nation's progress toward the transformation envisioned in *Best Care at Lower Cost*.

Another recent effort related directly to the work of this Committee was the conduct of an IOM workshop and production of a workshop summary on the core measurement needs for better population health, improved quality of health care, and lower health care costs. This 2-day workshop garnered perspectives from patients and consumers, health care delivery organizations, clinicians, public health experts, researchers, purchasers and payers, health economists, measure developers, regulators, clinical researchers, experts in health information technology, state governments, community organizations, and regional collaboratives. The workshop discussions drew on existing measurement initiatives, identified the limitations of current measurement efforts, and began to identify a framework for core measures and the necessary infrastructure for implementation. The workshop summary, *Core Measurement Needs for Better Care, Better Health, and Lower Costs: Measures That Matter*, summarizes those discussions and served as a first step in the process of identifying a common core measure set suitable for assessing the health system (IOM, 2013a).

In 2006, the IOM released *Performance Measurement: Accelerating Improvement*. The purpose of that report was to build the measurement infrastructure needed to advance the goals of the earlier *Quality Chasm* report (IOM, 2001). To that end, the authoring Committee selected measures that would support quality improvement across the health care enterprise and identified the infrastructure necessary to support the implementation of those measures at the regional and national levels. The report endorses a starter set of performance measures with a strong evidence base, most of which were drawn from measure sets and individual measures acknowledged by major stakeholder groups. The report also analyzes the gaps in current measurement capabilities, identifying the need for measures in several areas, including efficiency, equity, and patient-centeredness; longitudinal care and care transitions; systems-level measures; and measures that can be used to assess care across multiple clinicians and organizations (IOM, 2006).

The 2002 IOM study *Guidance for the National Healthcare Disparities Report* was developed to provide guidance to AHRQ as it worked to improve the measurement and reporting of data on health disparities. The report highlights a variety of key issues relevant to core measures and presents potential approaches for measuring disparities consistently and accurately, as well as improving the availability of data on disparities for a range of valuable health measures (IOM, 2002).

Another prior effort to identify a set of core measures is documented in the 2009 IOM letter report *State of the USA Health Indicators*. This

report was intended to support the nonprofit State of the USA Inc., which was building an Internet site to assess the nation's progress along several dimensions, including education, environment, and health. The Committee responsible for that report proposed 20 measures that could provide a broad picture of health and health care, encompassing overarching indicators of health, social and environmental factors influencing health, health behaviors and risks, and the quality and cost of health care. The report emphasizes that these health measures should not be considered in isolation; rather, the nonprofit should show the interconnections between health and the other areas it is tracking, such as education and environment (IOM, 2009).

The IOM explores the social and environmental factors that affect overall health in the 2010 report *For the Public's Health: The Role of Measurement in Action and Accountability*. The authoring Committee found that the nation did not have the necessary tools to assess and respond to these factors, and that the lack of such information limited the nation's ability to improve Americans' health. To address these challenges, the Committee recommends that HHS provide greater leadership, coordination, and guidance on population health information and statistics; that HHS lead the creation of a core measure set focused on priority health outcomes to improve alignment and enable comparisons among different communities, regions, and states; and that the nation adopt a single summary measure of population health that yields an overall picture of health and well-being at multiple levels. These recommendations were intended to provide greater understanding of the factors that influence health and to galvanize action toward better health (IOM, 2011b).

In 2013, the IOM released an examination of HHS's public health quality initiatives and the Leading Health Indicators for *Healthy People 2020*, with a particular focus on measures that can promote integration of clinical care and public health. The report *Toward Quality Measures for Population Health and the Leading Health Indicators* suggests that every community should use measures to assess progress on the Leading Health Indicators and recommends a systematic approach to developing and managing a portfolio of measures that span the entire health system. The authoring Committee also developed a logic model that shows the relationships among social, environmental, and behavioral factors; resources and community capabilities; interventions; and overall health outcomes. To show how this model translates to practice, the report includes four case studies illustrating how the model could be used to demonstrate the pathways from structure to process to outcomes and guide the development of quality measures (IOM, 2013b).

In a complementary project, a series of IOM consensus studies has focused on integrating population health factors into electronic health

records. The Phase 1 report, *Capturing Social and Behavioral Domains in Electronic Health Records*, identifies various domains and potential candidates for assessing such issues as socioeconomic status, race and ethnicity, sexuality, and health behaviors in the context of clinical records (IOM, 2014a). The Phase 2 report identifies with greater specificity 12 measures related to the selected domains and addresses issues related to incorporating these elements into electronic health records in a standardized way (IOM, 2014b). These recommended measures include four that are already in widespread use—race/ethnicity, tobacco use, alcohol use, and residential address—as well as an additional eight social and behavioral measures—education, financial resource strain, stress, depression, physical activity, social isolation, exposure to violence, and neighborhood median household income.

These many prior IOM activities provided a strong foundation for the assessment and recommendations presented in this report.

CORE MEASURES AND ISSUES: PREVIEW

A brief preview of the Committee's recommended core measure set and approaches to certain issues is warranted. Presented in Table 1-1 is the analytic framework for the core measures. Because the scope of concepts, activities, and priorities is broad for each aspect of the four domains outlined above (healthy people, care quality, care costs, and people's engagement in health and health care), the Committee's working assumptions on the domains, their key elements, and associated core measure foci are presented below. Also summarized are the approaches taken to the issues of best current measures, related priority measures, disparities, and implementation, which are presented in detail in Chapter 4.

Domains

The Committee's charge was to identify measures that best reflect healthy people, care quality, care costs, and people's engagement in health and health care. Implicit in that charge is the notion that while the foundational societal aspiration is healthy people, population health is a product of the dynamics in each of these vital and interrelated domains of influence on health. The goal of healthy people cannot be achieved without quality care or engaged people. Gains in the quality of care and population health cannot be sustained without affordable care. And care quality and affordability cannot be optimized without engaged people.

Key Elements

Facilitating progress within and among these domains of influence depends on how their component elements are addressed. Although they may be characterized in different ways and often are interrelated at some level, each of the key elements presented in Table 1-1 is central to progress in health and health care. Quality of life is a goal basic to every individual, and although length of life is not an immutable goal for every person at every stage of life, it is an accepted standard for the overall health of populations. It also is now well established that the health of populations is substantially shaped by factors outside of health care, including patterns of health-related behaviors and social circumstances such as physical environments and socioeconomic status. High-quality care is a function of the interplay among access to care, prevention, and appropriate treatment.

Core Measure Set

The Committee proposes the core measure set presented in Table 1-1. Each core measure focus identified by the Committee represents an important focus for action at the national, state, local, and even institutional levels.

Measure development and standardization were beyond the scope of the Committee’s charge. However, to accelerate the development and

TABLE 1-1 Core Measure Framework

Domain	Key Element	Core Measure Focus
Healthy people	Length of life	Life expectancy
	Quality of life	Well-being
	Healthy behaviors	Overweight and obesity
		Addictive behavior
		Unintended pregnancy
Care quality	Healthy social circumstances	Healthy communities
	Prevention	Preventive services
	Access to care	Care access
	Safe care	Patient safety
	Appropriate treatment	Evidence-based care
	Person-centered care	Care match with patient goals
Care cost	Affordability	Personal spending burden
	Sustainability	Population spending burden
Engaged people	Individual engagement	Individual engagement
	Community engagement	Community engagement

application of a fully specified core measure set, the Committee has specified what in its judgment is the best currently available measure for each core measure focus. This measure set, while imperfect, represents in the Committee's view a powerful starting set of "vital signs" for tracking progress toward improved health and health care in the United States. The Committee believes further that the core measure set recommended herein comprises the vital signs on the status and progress of the nation's health and health care, that a single measure can be chosen or developed for each of the core measure foci within each domain of influence, and that the development of a standardized measure is essential for each focus. The Committee also believes that, when applied, attention to these core measure foci will have the multiplier effect of improving performance broadly throughout the health and health care organizations engaged in their use.

Development Priorities

As noted above, the Committee has not specified each core measure in detail because, with few exceptions, the collaborative process of definition and refinement needed to develop widely accepted and fully specified measures was beyond the resources and scope of this study. Standardized measurement approaches exist for life expectancy and overweight and obesity, but such refinement has not yet been accomplished for measures in many other key areas, such as well-being, addictive behavior, healthy communities, evidence-based care, spending burden, and individual and community engagement. This is particularly true for individual and community engagement measures. The Committee focused considerable discussion on this focus, reflecting the relatively nascent state of conceptual and technical development of measures in this field. Committee members' perspectives were divided on the question of whether the strength and precision of the definitions and measures available for engagement warranted their inclusion alongside the domains of health, care quality, and care cost. Still, there was strong sentiment within the Committee that individual and community engagement are significant determinants of health and health care, clearly working in service to and as elements in the success of activities directed at the Triple Aim of better health, better care, and lower costs. Nonetheless, considerable definitional and analytic work will be required to develop practical measures that can reliably capture the extent to which individuals are prepared for and engage in effective participation in health and health care planning, delivery, and improvement. Additionally, research is needed to explore how levers available for community-wide action are being employed effectively for improvement in matters of central importance to the health of the population. Given the identification of engagement as a domain in the Committee's statement of task and the acknowledgment

within the Committee that engagement represents an important—if under-developed—element of the changing landscape of health, the Committee’s deliberations were guided by the four domains of health, care quality, care cost, and engagement.

Best Current Measures

Because most of the core measure foci shown in Table 1-1 are not supported by standardized measures accessible for application at every level of the health system, the Committee also specified, and presents for consideration in Chapter 4, best current measures for the core measure foci. Examples include the use of childhood immunization as a best current measure of the delivery of preventive services and self-reported health status as an indicator of well-being. Many of these best current measures are currently imperfect because of limitations in scope, reliability, generalizability, or conceptual boundary and will require substantial work. For this reason, the Committee recommends in this report that, as stakeholders at various levels try out their own proxies for the core measure foci in the short term, the Secretary of HHS steward a broadly inclusive process to marshal the nation’s experience and expertise in the development of the standardized set of core measure foci, see Chapter 5.

Related Priority Measures

The Committee recognized that, while ripple or multiplier effects are anticipated as a result of the use of the 15 core measure foci identified, those foci will not be sufficient to serve all of the interests of given organizations. To begin to address this challenge, the Committee also identified 39 “related priority measures” for consideration, presented in Chapter 4. These measures, together with the core measures, give a more detailed view of the health system and are sufficiently granular and specific to be actionable by stakeholders as needed for their particular circumstances. The Committee believes that, as with the core measure foci, specification and stewardship of standardized approaches ought also to be undertaken for these related measures, although as a follow-on activity to that for the core measure foci.

Disparities

The Committee presents in Chapter 4 and in discussion throughout this report data available for the core measure foci, and well beyond, that highlight the substantial disparities among subpopulations in the United States with respect to health status and health care. These include disparities based on race, ethnicity, income, education, gender, geography, and urban or rural

location. In the aggregate, this issue represents one of the greatest single health and health care challenges to the nation. Accordingly, the Committee considered recommending the development of a separate core measure aimed specifically at disparities. Instead, because the issue is so pervasive, the Committee discusses disparities in conjunction with each core measure.

Implementation

The Committee emphasizes that the process of refining, applying, and implementing the core measures is fundamental to success. Although face validity was a central criterion in identifying each measure, these core measures will not implement themselves. A carefully designed effort under the stewardship of the HHS Secretary will be needed to focus the nation's attention in a manner that will accelerate progress across the board. Therefore, the Committee's recommendations place particular emphasis on the roles, responsibilities, and opportunities for implementation—the critical features and actions necessary to achieve adoption and application of the core measures. At the same time, the multilevel and broad-based features of the implementation activities identified by the Committee are also intended to reflect both content and processes that are as catalytic and open as possible.

ORGANIZATION OF THE REPORT

This report summarizes the Committee's deliberations on the issues, options, and successful strategies with respect to advancing measurement and enhancing collaborative efforts around measurement in the four domains of healthy people, quality of care, costs of care, and people's engagement in health and health care. The evidence is distilled into detailed findings throughout the report that serve as the basis for the Committee's conclusions and recommendations. Each recommendation describes a key goal for advancing measurement and is accompanied by specific strategies that stakeholders should undertake in implementing the recommendation. Additional actions will be needed from multiple stakeholders to sustain and advance the implementation process.

Following this introduction are five chapters. Chapter 2 describes the current use of measurement in health and health care in America. It includes discussion of existing measurement purposes and requirements, limitations in current measurement capacity, and the burden of measurement on the care system.

Chapter 3 provides an introduction and overview for the core measure set proposed by the Committee, including a description of the Committee's deliberative process in approaching and completing the task of identifying these measures. Additionally, this chapter considers the potential benefits of

adopting core measures, how the focus of measurement can be expanded to encompass concepts meaningful to patients and the public, and desirable characteristics for a core measure set.

Chapter 4 presents the proposed core measure set, along with best current measures for use while the process of refining these measures is under way. This chapter serves essentially as a handbook for the core measures by providing details on each of the measures in turn, including the rationale for its selection, as well as the availability and quality of current data and measures and the path forward for improvement.

Chapter 5 outlines issues and approaches with respect to implementing the measure set and ensuring that it is updated and improved over time. Included is discussion of potential data production for dissemination of the core measures, as well as the uses envisioned for the measures by the Committee across stakeholder groups. Key challenges for stakeholders are identified, and approaches for integrating the core measures into existing programs, policies, and reporting activities and requirements are discussed.

The report concludes with an action agenda in Chapter 6 that summarizes the Committee's findings, conclusions, and recommended actions for different stakeholder groups to achieve improved alignment and focus in measurement. This chapter also identifies the contextual features important for successful implementation of the core measures.

Finally, the report's appendixes present prominent measurement initiatives, the landscape for reporting initiatives, and current data capabilities.

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2

Health and Health Care Measurement in America

Improving the U.S. health system depends on the ability to measure effectively its performance and the factors that shape its performance. Measurement is necessary to learn what works, to guide resources toward effective initiatives, and to promote accountability.

The constellation of health measurement activities in the nation has proliferated out of interest in improving the targeting of various initiatives—for example, local disease control, program planning, resource allocation, legislative and regulatory requirements, and monitoring of progress in health and health care. Expanded measurement capabilities have helped focus a variety of interventions across the health system, thereby contributing to positive impacts on health and health care. As understanding has grown about the many factors shaping individual and population health and technical capacity for tracking has advanced, the scope of health measurement has broadened to include a large number of process and outcome targets relevant to health and health care, from social determinants and programs to physician and hospital performance, patient experience, and costs of care.

Along with this burgeoning measurement capacity have come certain challenges. Like any improvement activity, measurement requires up-front investment to create the necessary capabilities. Assessment needs to be efficient with respect to the amount of information produced for a given investment in resources, but even so, existing measurement programs do not yet capture all of the key information needed for progress. Significant gaps exist in knowledge and understanding of what works in population health,

quality care, cost control, and patient engagement, and those knowledge gaps are paralleled by measurement gaps.

This chapter provides an overview of the current landscape of health and health care measurement in the United States. It begins by summarizing policy initiatives that are drawing increased attention to the need for measurement. The chapter then describes the various purposes for health and health care measurement and the measurement activities that currently serve those purposes. Next is a discussion of the limitations of these current activities. The final section addresses the issue of the measurement burden on health care providers and organizations.

POLICY INITIATIVES PROMPTING ATTENTION TO MEASUREMENT

The multiple changes occurring throughout the health system create a compelling need for reassessment and sharpening of existing measurement activities. Rapidly evolving models for delivering, paying for, and organizing health care, as well as collaborations designed to improve health, all require new approaches to measurement for accountability. Some new forces are encouraging the integration of clinical care, while others are driving a community or regional approach whereby stakeholders collaborate to improve health care quality while controlling costs, and partnerships are bringing together health care and community organizations with a broad focus on improving health. These initiatives are occurring at multiple levels—national, state, regional, community, and institutional.

The movement to accountable care is a prominent example of the impact of new models of care on approaches to measurement. The establishment of accountable care organizations (ACOs) is a key feature of the Patient Protection and Affordable Care Act (ACA), proposed to replace the often fragmented and uncoordinated care system with a system that integrates the care received by a patient, with payment incentives aimed at individual and population health outcomes (Fisher et al., 2007). The Centers for Medicare & Medicaid Services (CMS), the federal agency responsible for implementing the ACO model, has launched several relevant programs, including the Medicare Shared Savings Program, the Pioneer ACO model, the Advance Payment Initiative, and Medicaid ACOs. In addition, private insurers, employers, and others have established ACO programs. Recent estimates suggest that more than 600 ACOs are now in existence (Peterson et al., 2014).

Numerous other care delivery reforms also call for tracking measures. Patient-centered medical homes, clinics devoted to high-risk patients, team-based care models, and retail clinics, for example, are changing the traditional capabilities, roles, and culture of care. Innovations in health care

payment, including bundled payments, pay-for-performance initiatives, global payments, and value-based insurance design, also are driving change throughout the health system.

Another ACA-related development affecting measurement priorities is the law's creation of insurance marketplaces to expand individual access to affordable health insurance. The marketplaces, or exchanges, established under the ACA are not homogeneous: 16 states and the District of Columbia developed state-based marketplaces, 7 states developed marketplaces that are partnerships between the federal and state governments, and the marketplaces of 27 states are federally facilitated (KFF, 2014). The goal of these marketplaces is to provide a place for people to purchase individual insurance, with easily understandable information to support decisions among coverage options. They are coupled with other changes to insurance, such as setting essential benefits, communicating benefits, and other regulatory requirements. Clearly, participants in the various marketplaces will depend on the generation of reliable data on which to base program operations and improvement priorities.

At the vanguard of the myriad changes occurring in health care delivery is the widespread adoption of electronic health records (EHRs) and other health information technologies, enabling the gathering and use of measurements on a wide range of services, costs, and outcomes. Recent policies, such as the financial incentives offered under the Health Information Technology for Economic and Clinical Health (HITECH) Act, have incentivized the adoption and meaningful use of EHRs. The HITECH Act authorized a program of incentives and penalties that, according to Congressional Budget Office (CBO) estimates, amount to as much as \$30 billion in additional federal Medicare and Medicaid payments (Blumenthal, 2009; Buntin et al., 2010). The adoption of EHRs has increased since the act's implementation, yet more changes need to occur for all providers to utilize interoperable, comprehensive systems. In 2013, 78 percent of office-based physicians used any type of EHR system, and 48 percent reported having a system that met the criteria for a basic system (Hsiao and Hing, 2014). The availability, interoperability, harmonization, and reliable use of EHRs are foundational to a successful national measurement capacity.

States have a key leadership role in reshaping health and health care, and their measurement needs and policies are therefore a priority. For example, Massachusetts enacted plans to expand insurance coverage through a Connector, a forerunner of the insurance exchanges developed under the ACA, and additional coverage options for low-income adults and those ineligible for employer-sponsored insurance (Raymond, 2011). Beyond coverage, the state has implemented programs aimed at improving quality and value, including payment reforms and quality improvement initiatives (McDonough et al., 2008; Raymond, 2011; Song and Landon, 2012).

Other states, such as Utah, also established marketplaces prior to the passage of the ACA for use by their residents for purchasing individual health insurance policies (Corlette et al., 2011). **As another example of state reforms**, Vermont has implemented the Vermont Blueprint for Health, which includes patient-centered medical homes, community-based support teams, a statewide health information network, and other enhanced data systems (Bielaszka-DuVernay, 2011). And Oregon is transforming its Medicaid program to deliver care through coordinated care organizations—designed to be advanced versions of ACOs—which have received additional support in exchange for a commitment to reducing per capita Medicaid spending (Stecker, 2013).

Still other initiatives—such as the Aligning Forces for Quality program, the Chartered Value Exchange program, Beacon Communities, and the Triple Aim Initiative—are aimed at driving change at the regional and community levels (Maxson et al., 2010; McCarthy and Klein, 2010; Painter and Lavizzo-Mourey, 2008; Young, 2012). Each has its own measurement requirements and contributes insights for the conversation on measurement. For example, the Aligning Forces for Quality program consists of 16 collaboratives across the country that convene multiple stakeholders to address local challenges in care. The collaboratives employ different strategies for measuring and reporting health system quality, cost, and patient experience; engaging patients in care and care redesign; and testing new payment models (AF4Q, 2013; Mende and Roseman, 2013; Painter and Lavizzo-Mourey, 2008; Roseman et al., 2013; Scanlon et al., 2012). Similarly, two Wisconsin multi-stakeholder groups—the Wisconsin Collaborative for Healthcare Quality and the Wisconsin Health Information Organization—are working to increase the supply of data on health care quality and value to support value-based payment (Toussaint et al., 2011). More than 30 Regional Health Improvement Collaboratives are in place across the United States.

The combination of these changes to care delivery, payment, and coverage necessitates new capabilities for measurement. Measurement programs need to be adjusted to account for new models of care; to respond to the emerging needs of health care improvement, payment, and accountability; and to enable sharing of information with patients and consumers on their care and coverage options. These changes also add to the urgency of the need for broad assessment and streamlining of the measurement system, with a reliable standardized set of measures at the core to guide action and assess results.

CURRENT MEASUREMENT PURPOSES AND ACTIVITIES

As discussed in Chapter 1, the health measurement enterprise has grown significantly over time, with new measures continually being developed and refined. More than 60 years ago, Congress established the National Committee on Vital and Health Statistics to identify the needs for health statistics, data, and information (HHS, 2000). Some 35 years ago, the national Healthy People initiative brought attention to the potential gains to be realized from health promotion and disease prevention activities, providing a view of the overall health of the nation, setting national goals and objectives for health improvement, and underscoring that the focus of measurement should be on matters most important to health outcomes (IOM, 1990). Since the publication of *Healthy People: The Surgeon General’s Report on Health Promotion and Disease Prevention*, the Healthy People initiative has updated its vision and assessment every decade, most recently with *Healthy People 2020* (HEW, 1979; Koh, 2010). Since that time, moreover, the number of organizations involved in assessing the progress of the health system has grown substantially, reflecting the growing national interest in quantifying performance (as illustrated by the examples presented in Table 2-1). These initiatives vary in their scale, considering performance at the

TABLE 2-1 Example Measure Set Sponsors and Users for the Four Domains Influencing Health

Domain	Responsible Organization (measures/measurement activities)
Healthy People	<ul style="list-style-type: none">Centers for Disease Control and Prevention (CDC) (e.g., Community Health Status Indicators; National Center for Health Statistics [Health, United States]; Office of Surveillance, Epidemiology, and Laboratory Services; National Health and Nutrition Examination Survey)Census Bureau (American Community Survey)County Health Rankings (with the University of Wisconsin Population Health Institute and the Robert Wood Johnson Foundation [RWJF])National Institutes of Health (NIH) (e.g., Healthy Communities study [collaboration with CDC and RWJF])National Quality Forum (NQF) (e.g., convening of National Priorities Partnership and Measure Applications Partnership, endorsement of population health measures)Private insurers and health plans (e.g., United HealthCare Foundation’s America’s Health Rankings)State of the USA project (e.g., State of the USA Health Indicators)State and local governments (e.g., data on reportable diseases, vital statistics)United Health Foundation (e.g., America’s Health Rankings)U.S. Department of Health and Human Services (HHS) (e.g., <i>Healthy People 2020</i> and the <i>Healthy People 2020</i> Leading Health Indicators)

continued

TABLE 2-1 Continued

Domain	Responsible Organization (measures/measurement activities)
Care Quality	<ul style="list-style-type: none"> • Agency for Healthcare Research and Quality (AHRQ) (e.g., National Healthcare Quality Report, National Healthcare Disparities Report, National Quality Measures Clearinghouse, Consumer Assessment of Healthcare Providers and Systems [CAHPS]) • American Heart Association (AHA) (e.g., Committee on Performance Improvement) • American Medical Association (AMA) (e.g., convening of the Physician Consortium for Performance Improvement) • Ambulatory Care Quality Alliance (AQA) (e.g., multi-stakeholder collaborative with focus on using measurement to facilitate improvement and promoting best practices in reporting) • CDC (e.g., National Healthcare Safety Network) • Centers for Medicare & Medicaid Services (CMS) (e.g., Hospital Compare, Physician Compare, Physician Quality Reporting System, Shared Savings Program [accountable care organization] measures, Medicaid/Children's Health Insurance Program [CHIP] Pediatric Health Care Quality Measures) • Health Resources and Services Administration (HRSA) (e.g., HRSA Clinical Quality Core Measure Set) • Institute for Clinical Systems Improvement (e.g., development of evidence-based guidelines and support for collaborative initiatives for measure development) • Joint Commission (e.g., ORYX) • Leapfrog Group (e.g., Hospital Safety Score) • Minnesota Community Measurement • NCQA (e.g., Healthcare Effectiveness Data and Information Set [HEDIS] measures, recognition of patient-centered medical homes, accreditation of accountable care organizations) • NIH (e.g., Patient Reported Outcomes Measurement Information System [PROMIS]) • NQF (e.g., convening of National Priorities Partnership and Measure Applications Partnership, endorsement of quality measures) • Occupational Safety and Health Administration (OSHA) (e.g., data on health worker safety, injuries) • Office of the National Coordinator for Health Information Technology (ONC) (e.g., meaningful use measures) • Pharmacy Quality Alliance (e.g., medication adherence, appropriate use, overuse) • Premier (e.g., QUEST collaborative measures) • Private insurers and health plans • Quality Alliance Steering Committee (e.g., High-Value Health Care Project) • Specialty societies and professional societies (e.g., National Surgical Quality Improvement Program, registries) • State and local governments • Utilization Review Accreditation Committee (e.g., measurement for accreditation programs) • Veterans Health Administration (e.g., ASPIRE, Surgical Care Improvement Project, Linking Information, Knowledge and Systems, Medical Home Initiative) • Wisconsin Collaborative for Healthcare Quality

TABLE 2-1 Continued

Domain	Responsible Organization (measures/measurement activities)
Care Costs	<ul style="list-style-type: none">• AHA (Annual Survey of Hospitals with information technology supplement)• AHRQ (Healthcare Costs and Utilization Project, Medical Expenditure Panel Survey [in conjunction with Census Bureau and CDC])• CDC (National Health Interview Survey [collaboration with Census Bureau], Medical Expenditure Panel Survey [collaboration with Census Bureau and AHRQ])• Census Bureau (National Health Interview Survey [collaboration with CDC], Medical Expenditure Panel Survey [collaboration with CDC and AHRQ])• CMS (National Health Expenditure Data)• NQF (endorsement of resource use and cost-of-care measures)• Private insurance and health plans• Quality Alliance Steering Committee (High-Value Health Care Project)
Engaged People	<ul style="list-style-type: none">• AHRQ (e.g., CAHPS)• HRSA (e.g., Health Center Patient Satisfaction Survey)• Universities and academic organizations (e.g., Patient Activation Measure)

SOURCE: Adapted from IOM, 2013a.

county, state, or national level; in their focus, from physicians to hospitals and health plans; and in their data sources, from surveys and registries to clinical and payment records (AHRQ, 2013; Hussey et al., 2009; IOM, 2006; NQF, 2013d; Wold, 2008). Given the diverse sources and purposes of existing data, substantial work is needed to develop high-quality core measures.

Paralleling the diversity of organizations involved in measurement is the variety of uses for health measures: care improvement at multiple levels; disease surveillance, prevention, health promotion, and population health management; costs and outcomes reporting and transparency; health and safety regulation; professional certification and facility accreditation; payment incentives, benefit design, and purchasing decisions; tracking and reporting of grant performance; health services and effectiveness research; and patient and public experience and satisfaction (Berwick et al., 2003; IOM, 2006, 2011a, 2013a,b). Variation exists as well in the application of measures for these different purposes.

One analysis found that measures are used most commonly in health care for quality improvement and public reporting; they are used for payment almost half as frequently, and an even smaller number of measures are used for accreditation, certification, credentialing, and licensure (Damberg et al., 2011). A measure’s intended application is important to consider, as

the requirements placed on measures differ for each type of use. Application of a measure toward payment or public reporting will necessitate stronger requirements for statistical validity and conceptual accuracy than will use of a measure for internal improvement purposes. Therefore, measures must be considered in light of their intended application, as that will determine their suitability. The various uses of measures and related measurement activities are summarized in the remainder of this section, as well as in the appendixes to this report.

Monitoring of Population and Community Health Status

The Centers for Disease Control and Prevention's (CDC's) National Center for Health Statistics (NCHS) bears primary responsibility at the federal level for monitoring overall population health status. Its maintenance of vital statistics and data on reportable diseases is based on a blend of national standards and local application. Both vital statistics, which include births and deaths, and data on reportable diseases are recorded separately by each of the 50 states, the District of Columbia, and the territories, with national statistics being compiled from these local data through agreements with national entities. The agreements include some requirements for the data, as the decentralized data collection process introduces challenges of data consistency, comparability, quality, and timeliness (NRC, 2009). These data present an almost complete picture of the health status of the nation: one study, for example, found that the vital statistics system captures more than 99 percent of the nation's births and deaths (Guyer et al., 2000).

Since the early 1960s, the CDC also has administered the periodic comprehensive National Health and Nutrition Examination Survey (NHANES) and the National Health Interview Survey, which provide data on the health status of adults and children. Besides providing information about a variety of national health issues, the NHANES supports epidemiologic research and assessment of health promotion and disease prevention programs (NCHS, 2013).

In addition to these targeted efforts, as discussed above, the U.S. Department of Health and Human Services (HHS) is in its fourth decade of producing, through the Healthy People initiative, regular national assessments of the nation's health, as well as progress on goals and objectives established for its improvement. The most recent of these assessments, *Healthy People 2020*, has a five-part mission: develop priorities for nationwide health improvement; expand awareness of the determinants and factors influencing health, disease, and disability; identify measurable objectives and goals at multiple levels; build sectors across the health system to improve policies and practice; and describe areas in which knowledge needs to be increased through research and data (IOM, 2011b). Pursuant to these

goals, it is necessary to identify indicators that can be used to gauge meaningful progress on the nation's health. *Healthy People 2020* contains more than 1,200 objectives that can be used to monitor health, and its Leading Health Indicators are a focused set of 26 indicators in 12 categories that collectively capture the major trends in the public's health (see Appendix D for the full list).

HHS also collects and reports data and monitors progress on key issues related to prevention through the National Prevention Strategy, housed in the office of the Surgeon General of the U.S. Public Health Service. Released in 2011, the National Prevention Strategy presents a vision for the future of prevention in the nation, along with goals, priorities, and associated resources. This initiative and its related activities, in such areas as smoking cessation, addictive behaviors, community health and safety, and health disparities, depend on reliable comparable measures for tracking progress (HHS, 2011).

A number of other measurement activities focus on assessing progress in population and community health. For example, the County Health Rankings project reports status and trends related to physical environment, social and economic factors, clinical care, health behaviors, and overarching health outcomes for nearly every county in the United States. Similarly, America's Health Rankings, a program administered by United Health Foundation, uses measures of both health outcomes and health determinants to develop assessments of health in different states (United Health Foundation et al., 2012).

Another related initiative is the Key National Indicators project, overseen by the congressionally mandated Commission on Key National Indicators. The Key National Indicators, currently being maintained by the nonprofit State of the USA, encompass the state of the nation more broadly, with a focus on indicators of economic growth, development, and stability, but they also cover the state of American health and related health factors such as environment, education, and employment (The State of the USA, 2014).

Multi-stakeholder collaboratives have developed programs for assessing health in communities with the goal of understanding how to improve their health outcomes. The Network for Regional Healthcare Improvement (NRHI) serves as a national association of Regional Health Improvement Collaboratives, coordinating and advancing initiatives focused on improved health care quality and payment reform across the nation (Rosen et al., 2012).

Personal Health Monitoring

A rapidly growing source of information for health-related measurement is patient-generated health data (PGHD) and data gathered via personal or remote site digital devices. According to the Office of the National Coordinator for Health Information Technology (ONC), PGHD is information created, recorded, gathered, or inferred by patients or their designees about health-related experiences and concerns (ONC, 2013). Traditionally, this largely historical information was provided by the patient verbally or in writing during clinical encounters, with no systematic processes in place to harness its utility for ongoing self-care management and longitudinal monitoring. The availability and characteristics of PGHD have changed dramatically in the last few years, driven in part by sophisticated technology capable of monitoring domains of wellness (i.e., exercise, diet, sleep) and patient-reported observations of daily life with illness. Additionally, health care reform legislation such as the ACA introduced new payment and delivery models that support the use of home-based sensors and monitoring devices for the collection of biometric data (i.e., blood glucose meters, pacemakers, pulmonary function devices). Federal certification criteria for EHRs qualifying under the Meaningful Use Program of HITECH include patient portals. Recommendations being considered for stage 3 of Meaningful Use include further support for PGHD by 2017. One limitation of this approach is that PGHD is limited to people within the clinical care system, so that results based on these data sources may be biased or of limited generalizability.

Although a nascent practice, some health systems have been experimenting with integrating PGHD into their clinical records. Group Health's electronic Health Risk Assessment (e-HRA), an early adopter, feeds patient-reported data from the patient portal into the EHR. The Palo Alto Medical Foundation conducted a clinical trial (EMPOWER-D) with wirelessly uploaded glucometer readings as well as patient-entered activity and meal information and found that more patients contributing PGHD than controls showed improvement in their A1C readings, demonstrating better control of their diabetes. Partners HealthCare launched a system in 2013 that uploads data from medical devices directly into the patient's EHR. The Veterans Health Administration began electronic health monitoring a decade ago and in 2013 monitored more than 140,000 veterans with high-risk chronic conditions (i.e., diabetes, hypertension, chronic obstructive pulmonary disease [COPD]), depression, posttraumatic stress disorder (PTSD), weight management issues, substance abuse, and spinal cord injuries (Darkins et al., 2008). And a study using pre-visit electronic journals at Brigham and Women's Hospital is shedding light on the process of engaging patients in planning ahead for a clinical visit and offers an opportunity to

integrate PGHD into the clinical work flow. Overall, these efforts, along with similar programs in other large health systems, such as Kaiser Permanente, Vanderbilt, and Geisinger, have shown promising results in supporting better health for individuals at lower cost to the system.

Since 2011, ONC has supported a series of reports and expert panels seeking insight into the opportunities and challenges associated with the use of PGHD in health care. These initiatives have explored a range of topics, including potential policy levers; the need for data standards; and the value of PGHD in achieving the three-part aim of better care, lower cost, and better health within a continuously learning health system (Shapiro et al., 2008). Many measurement organizations, including the National Quality Forum (NQF) and the National Committee for Quality Assurance (NCQA), have taken notice of PGHD. Working with the Agency for Healthcare Research and Quality (AHRQ), NQF identified patient-reported outcomes and patient-generated data in EHRs as priorities for the 2012 National Strategy for Quality Improvement in Healthcare (HHS, 2012). NCQA recently completed a comprehensive report on the use of health information technology to support patient and family engagement that includes support for relevant PGHD as a contributor to coordinated care (Paget et al., 2014).

Another growth area for PGHD relates to patient-reported outcomes. Now that many Americans' health information is captured and accessible electronically—by both providers and patients—the ability to obtain ongoing feedback from patients on their symptoms, pain, and functional status could make important contributions to evaluation of the impact of interventions and assessment of outcomes, although the quality and accessibility of these data are currently limited. Using the digital infrastructure now being established, the sampling of patient-reported outcomes can not only guide treatment of individuals but also provide outcomes for clinical research. Patient-reported outcomes are important measures that matter to people, which is a key consideration in the establishment of core measures.

While rapid growth has occurred in the potential use and value of PGHD, its utility remains largely limited and unstudied. Recently, NQF convened a multi-stakeholder group to provide guidance on priorities for the development and endorsement of performance measures for person-centered care and outcomes, in which PGHD and patient-reported outcome data play an important role. Patient-powered research networks (e.g., PatientsLikeMe, ImproveCareNow) are giving patients, researchers, and clinicians an unprecedented opportunity to capture the full patient experience in data models amenable to measurement development.

Quality and Patient Experience Assessment

Virtually all health care delivery organizations use measures for quality improvement purposes, from improving outcomes for specific procedures to optimizing operations for an entire institution. It is important to note that quality improvement places different demands on measurement than on other uses, such as payment or public reporting. Therefore, quality improvement initiatives can use measures that may not be appropriate for other purposes—depending on the measure’s accuracy, precision, evidence base, or representativeness—and thus present an opportunity to test measures in practice without the consequences of changing financial incentives or impacting an organization’s reputation. For example, Intermountain Healthcare has used care process measures embedded in its clinical data systems and applied across clinical units. One result of this quality improvement effort was reengineering of the organization’s labor and delivery protocol to reduce the use of elective delivery, unplanned cesarean sections, and newborn intensive care units, thereby saving an estimated \$50 million each year in the state of Utah (James and Savitz, 2011).

Over the past quarter century, a number of organizations have assumed various responsibilities for advancing broad-based quality improvement activities. NQF was founded in 1999 in response to a presidential commission’s recommendation to develop a forum on health care quality measurement and reporting (NQF, 2013a). The organization’s mission comprises three aims: “build consensus on national priorities and goals for performance improvement, and work in partnership with the public and private sectors to achieve them”; “endorse and maintain best-in-class standards for measuring and publicly reporting on healthcare performance quality”; and “promote the attainment of national healthcare improvement goals and the use of standardized measures through education and outreach programs” (NQF, 2013c, p. 68). Three recent NQF initiatives have garnered significant national attention. First, the National Priorities Partnership, a public-private partnership comprising more than 50 organizations, provided stakeholder input into the development of the National Quality Strategy. Second, the Measure Applications Partnership, which was included in the ACA, seeks to align measures across federal programs and between the public and private sectors. Notably, the Measure Applications Partnership provides pre-rule-making input for federal public reporting and performance payment programs, and it has introduced the concept of families of measures for aligning measurement of specific concepts. Finally, the NQF Buying Value initiative convened private and public purchasers aiming to transition toward paying for value, with the goal of aligning value-focused purchasing efforts to increase the success of these efforts.

NCQA, a private, nonprofit organization founded in 1990 “to transform health care quality through measurement, transparency, and accountability,” represents the first broad-based attempt at value-based purchasing (NCQA, 2013a). NCQA stewards the Healthcare Effectiveness Data and Information Set (HEDIS), which consists of approximately 80 measures in five domains and is used by more than 90 percent of health plans to measure performance (NCQA, 2013b,c). Beyond this tool, NCQA offers accreditation programs (e.g., for ACOs), certification programs (e.g., for disease management), physician recognition programs (e.g., for patient-centered medical homes), and health plan report cards.

A third organization working outside government to promote quality improvement is the Institute for Healthcare Improvement (IHI), founded in 1989. IHI works closely with health systems to drive down costs and enhance sustainability in both clinical and operational settings by “identifying proven and evidence-based strategies that demonstrate efficiency through the removal of waste, harm, and variation” (IHI, 2014). In the course of its work, IHI has developed a number of measures for use by the organizations within its sphere of activities. Its quality-based programs include diagnostic assessments of measurement methodologies, comprehensive approaches to the scaling up of efficiency efforts, and approaches to improving quality and lowering costs for people with chronic conditions (IHI, 2014). IHI accelerates improvement through its partnerships and integrated strategy objectives by cultivating motivation for transformation and putting strategic plans into action. IHI’s formulation of the Triple Aim of better care, lower cost, and better health has become a standard reference point for many health improvement efforts.

The Joint Commission also plays an important role in assessment of care quality. As an independent nonprofit accreditation body, the Joint Commission administers on-site surveys to thousands of health care systems across the nation. The decision on each health care organization’s accreditation is made public, ensuring transparency to all interested stakeholders and the community at large. In many states, the Joint Commission accreditation fulfills state regulatory requirements for health care providers as well as Medicare and Medicaid certification (Joint Commission, 2014).

Within the federal government, health data quality improvement efforts have been stewarded by several agencies, in particular CMS, AHRQ, and the CDC, coordinated by the Secretary of HHS. In addition to the NCHS programs described above for assessing population health, the CDC operates a number of categorical clinical preventive service programs (e.g., immunization, cancer screening) with elements aimed at improving the quality of those services, in part through measurement.

CMS has perhaps the greatest impact in the quality measurement arena, leveraging measures for multiple purposes in Medicare, Medicaid, and

the Children's Health Insurance Program (CHIP). It has applied measures to its payment programs, such as the Medicare Shared Savings Program (ACOs), Medicaid health homes, and Innovation Center projects; public reporting programs, such as Hospital Compare, Physician Compare, and Medicare Advantage Star Ratings; and quality tracking, such as Medicaid Adult Health Care Quality measures and Medicaid/CHIP Children's Health Care Quality measures. Moreover, CMS provides technical assistance on measurement through the Quality Improvement Organization program and coordinates with a variety of measurement organizations on measure development and accreditation.

CMS also is working with ONC within HHS to spearhead the implementation and application of EHRs and the exchange of health information across the system. To further encourage the adoption of health information technology, two HHS programs—the Medicare EHR Incentive program and Medicaid EHR Incentive program—provide financial incentives for providers and hospitals to use EHRs meaningfully. The capture and reporting of quality measures are required for Meaningful Use.

AHRQ has undertaken a number of projects aimed at improving measurement of health care performance. These include assessments of national health care performance through the National Healthcare Quality Report and National Healthcare Disparities Report, which describe the current status and trends in care effectiveness, patient safety, access, timeliness, and patient-centeredness. AHRQ also has developed a number of indicators for gauging health care quality, including the Prevention Quality Indicators, Inpatient Quality Indicators, Pediatric Quality Indicators, and Patient Safety Indicators. Moreover, AHRQ has supported and overseen the Consumer Assessment of Healthcare Providers and Systems (CAHPS) program, which uses surveys to gather information on patient and consumer care experiences in a variety of settings. Different surveys are available for hospitals, health plans, surgical care, dental care, and a range of other care types and settings. AHRQ further stores evidence-based measures and measure sets in the National Quality Measures Clearinghouse and compiles measures used by HHS in the HHS Measure Inventory.

The U.S. Departments of Defense and Veterans Affairs (DOD and VA) have pursued a variety of initiatives aimed at improving health care performance through measurement. For example, the Military Health System's Quadruple Aim Innovation Challenge is aimed at promoting innovation in the health system around the quadruple aim of readiness, population health, experience of care, and per capita cost (HIMSS, 2012). At the VA, the Veterans Affairs Hospital Compare program allows patients and others to compare quality and performance at different hospitals and track progress on specific conditions over time (VA, 2011).

Finally, in addition to CAHPS, a variety of innovative projects are under way to further develop and refine the ability of the care system to monitor and assess patients' perspectives. An example is the CollaboRATE Score, a project of the Dartmouth Institute, which is in pilot testing as a survey tool for gathering feedback on patients' experience of shared decision making (Barr et al., 2014).

Transparency, Public Reporting, and Benchmarking

Comparisons offer inherent motivations and focus for progress, and measurement is a key tool and incentive for understanding and addressing variations within and among local clinical care practices, health care organizations, and the broader care system, enabling individuals and organizations to identify best practices in terms of positive patient health outcomes and improved value. For example, using a common measurement framework to understand variations in clinical outcomes of cardiac surgery can help identify the best practices of high performers throughout an organization (IOM, 2013a). In its studies of regional variation in health care spending and outcomes, Dartmouth has used benchmarking to show that cost, quality, and health care practice vary markedly across the country (Fisher et al., 2003a,b, 2009). A number of similar analyses of variations are under way.

CMS administers several comparative programs, including accountability systems such as Medicare Hospital Compare and Physician Compare that provide information for the public, and programs that report data on Medicare and Medicaid performance in terms of geographic variation and health care expenditures. CMS also operates a variety of systems that collect monitoring and compliance data to ensure that high-quality care is delivered to Medicare and Medicaid beneficiaries.

Another group active in promoting transparency is the Health Care Cost Institute (HCCI). HCCI, a nonpartisan and nonprofit organization, was established in 2011 to compile research and provide accurate information on costs associated with the U.S. health care system. Focusing on private health insurance claims data, HCCI strives to make transparent important information regarding the health care spending of privately insured individuals in the United States. To this end, HCCI developed a national claims database, populated by the nation's largest insurers and available to researchers interested in the causes of health care costs and utilization. In addition, HCCI issues biannual reports on regional, state, and national trends in health care spending for the general public, and it also aggregates these trends and conveys their implications and impact at the policy level.

States have a long history of publicly reporting information on health care performance. One of the first state performance reports came from

the New York State Department of Health, which started publishing data on risk-adjusted mortality for cardiac bypass surgery in 1989 (Chassin, 2002). The number of such programs has continued to grow, and half of all states now sponsor a program for public reporting on care quality (Ross et al., 2010). These programs vary considerably as to whether they include information on care processes or health outcomes, whether they describe performance only for common diseases or for other diseases as well, and how their data are generated (Ross et al., 2010). In addition to public reporting, more than half of all states operate a hospital adverse event reporting system that requires hospitals to report the incidence of specific types of patient harm. These systems vary significantly from state to state as to what types of adverse events must be reported (Levinson, 2008; Wright, 2012). One limitation of these systems is that because they are focused on care institutions and providers, they are not fully inclusive of the state's population, excluding those individuals who are not receiving care.

Publicly reported measures have been correlated with improved performance in the measured area and with organizational improvement activities (Hafner et al., 2011; Hibbard et al., 2003, 2005). Research found, for example, that publicly reported measures were associated with increased compliance with best practices in the use of prophylactic antibiotics for surgical patients (Chassin et al., 2010), improved quality of heart attack care (Werner and Bradlow, 2006, 2010), and improved compliance with recommended pneumonia care (Joint Commission, 2011).

Clinical registries have been used by a number of professional societies for benchmarking across care systems as well as for monitoring and for broader clinical research on health care procedures and outcomes. Registries are intended to collect data for a specific condition, disease, or treatment in a uniform way over time. Thus they can provide a detailed, consistent picture of a certain disease population or treatment that can be used for benchmarking against different regions or other characteristics, as well as over time. The data contained in registries tend to be more detailed and consistent than data available from other sources, which makes registries useful for determining the relative effectiveness of different treatments and interventions. However, these data sources also are limited in scope because their focus is on the subpopulation of people who are receiving care rather than on the total population.

Performance Requirements (Accreditation, Safety, and Payment)

Measurement in health care also is aimed at ensuring compliance or performance on certain dimensions of quality or service—for example, as a condition of accreditation or as a tool for ensuring compliance with payment or safety standards. The Joint Commission, for instance, provides

accreditation for a variety of health care organizations, from hospitals to behavioral health treatment facilities. To be accredited, these institutions must collect and submit to the Joint Commission data on a variety of performance measures. NCQA accredits health plans and offers voluntary programs for new care delivery models (Berenson et al., 2013). Examples of measurement programs from both organizations are included in the appendixes to this report. Similar programs, aimed at maintaining a baseline level of performance across diverse locations, populations, and facilities, are administered by organizations including the Environmental Protection Agency and the Occupational Safety and Health Administration.

Public and private payers have introduced multiple new payment models in an effort to move away from fee-for-service payment and to align incentives toward high-quality, high-value care. These new payment models often require clinicians and hospitals to collect and report multiple measures on care processes and outcomes. In some cases, financial incentives are directly tied to performance on a given measure, while in others a measure is used to ensure that quality and outcomes are not eroded under the new payment method (Schneider et al., 2011).

One recent change to the measurement capabilities of public payers is the Medicare & Medicaid Innovation Center (CMMI), which has the ability to test, evaluate, and expand care delivery and payment models in Medicare, Medicaid, and CHIP. If these models are found to be successful, the Secretary of HHS has the authority to scale them up nationally. CMMI has flexibility in measuring success in quality and outcomes, although all successful programs must be verified by the CMS actuary as reducing costs without affecting quality or as improving quality without raising costs. Another new measurement capability for public payers is State Innovation Waivers, which will allow states to test new models for their insurance exchanges, qualified health plans, and provisions such as cost sharing and coverage (Alker and Artiga, 2012; Artiga, 2011). Beyond payment, a variety of organizations are involved with accreditation and certification of health care in the United States, including the Joint Commission and NCQA. The Joint Commission accredits approximately 20,000 health care organizations and programs, while NCQA accredits health plans and offers voluntary programs for new delivery models (Berenson et al., 2013). Examples of measurement programs from both organizations are included in the appendixes.

Funder Reporting

Health-related federal grants to state and local governments have increased over the past three decades, amounting to nearly \$300 billion in fiscal year 2011, a figure that includes support for both the state Medicaid

programs and the various categorical initiatives (CBO, 2013). The focus of these grant programs has shifted over time, increasing for Medicaid and other health programs and decreasing for other activities.

From a measurement perspective, an especially important trend has been the federal government's use of its waiver authority to give states more flexibility in program design and to provide federal support for Medicaid and CHIP in return for a commitment to demonstrating progress toward agreed-upon targets. These waivers give states the flexibility to tailor programs to their needs and priorities, such as by expanding coverage to individuals not otherwise eligible, providing coverage for services not typically covered by the programs, or applying delivery system innovations to improve the quality and value of care (Alker and Artiga, 2012; Artiga, 2011).

For research and demonstration waivers, states are required to have an approved evaluation strategy in place (Alker and Artiga, 2012; Artiga, 2011). States have substantial flexibility in how they carry out their evaluation—including experimental and other quantitative and qualitative designs—as long as the final evaluation design is approved by CMS and published publicly (HHS, 2013). One commonality among the areas measured is program cost, as all approved projects must be budget neutral to the federal government over the course of the waiver.

The specific measures and strategies used to assess performance and provide accountability vary, with the details being determined by the authorizing and appropriations legislation; the agency's grant management processes, such as funding announcements and notification; and government-wide grant management legislation, regulations, and executive orders. While substantial variation exists, recent reviews of federal grants have identified opportunities to improve the measures and data used to track program performance (GAO, 2006, 2012).

Measures also are frequently used by federal agencies in evaluating the results of grants made to states and localities. One prominent example is the Preventive Health and Health Services block grant, which allows states to pursue projects aligned with the Healthy People program. The program incorporates a variety of standardized measures of performance (CDC, 2011). Another example is the CDC's Immunization Grant Program (Section 317), which provides aid to underinsured and low-income families for whom vaccinations impose a significant cost challenge. The Section 317 program also provides funding for immunization infrastructure (CDC, 2007). Similar grant programs are in place to provide added support in health programs related to cancer screening, community health, and other focal areas.

LIMITATIONS OF CURRENT MEASUREMENT ACTIVITIES

With any measurement activity, the reliability of the data collected is a function of the ability to guard against hazards that are inevitably encountered in the design, execution, analysis, and interpretation of results. The statistical and analytical challenges associated with health and health care assessment have been a focus of various assessments by the Institute of Medicine (IOM) and are summarized in Table 2-2. These challenges include gaps in coverage, comparability, consistency across sources and time, and statistical power. Other limitations in the ability to use the measures gathered relate to the capability to sustain data collection, the availability of and linkage to accountability levers, data quality and availability, and the programmatic distortions that may occur when an organization's

TABLE 2-2 Key Considerations in Addressing Statistical and Analytical Challenges of Measurement

Statistical or Analytical Challenge	Key Considerations
Attribution	When essential, can patient health outcomes, such as for acute or chronic conditions, be attributed to a specific clinician or health care organization?
Data sources	Can a measure be calculated from existing electronic health records or related sources such as survey, claims, and laboratory data?
Statistical accuracy and patient samples	For the average provider or health care organization, will there be a sufficient number of patients to enable estimating a performance measure with adequate confidence to support its use in a payment mechanism?
Tailoring care	Does a measure exclude patients who should not receive certain care based on clinical practice guidelines?
Risk adjustment	When necessary, can performance measures be properly adjusted for different patient populations with different risk factors, demographics, and health conditions?
Setting benchmarks	Do sufficient data exist with which to establish a performance benchmark for a measure, as well as for consistent attribution, risk adjustment, and data quality and completeness?
Potential for gaming	How difficult is it to change a measure's score without any improvements to care or health? Will the measure's value be altered by excluding patients with significant illnesses or health conditions?
Validity	How well does a measure capture the process or outcome it is intended to assess?

SOURCES: Adapted from IOM, 2012, and Schneider et al., 2011.

compass is drawn to process rather than outcome measures. These issues are discussed below.

Gaps

With efforts to initiate, require, and collect measures being carried out by many often unconnected and uncoordinated sources, inconsistencies and gaps are inevitable (IOM, 2006; Jacobson and Teutsch, 2012; NQF, 2013b,d; Schneider et al., 2011; Thompson and Harris, 2001). Many measurement initiatives focus on processes of health care, with limited consideration of outcomes (NQF, 2013b). Current measurement programs often do not adequately address key issues related to the leading causes of illness and death (Thompson and Harris, 2001). Examples of the many gaps in current measurement efforts include

- *Patient engagement*—few capabilities to assess patient-centered care and patient engagement;
- *Care quality*—limited scope of quality measurement for certain areas, such as special populations (e.g., children/adolescents, patients with multiple chronic conditions, patients with rare diseases, patients dually eligible for Medicare and Medicaid), care access and disparities, care coordination and transitions, and broader longitudinal accountability (such as over a patient’s entire course of treatment or for overall health outcomes);
- *Value*—limited capacity to assess value, affordability, waste, and overuse; and
- *Healthy people*—small number of measures that assess population health and well-being outside of the health care system, the use of high-impact clinical preventive services, and childhood development and health (IOM, 2006; Jacobson and Teutsch, 2012; NQF, 2013d; Schneider et al., 2011).

Another factor limiting the efficiency of measurement is the inadequate level of interoperability among different data sources. For instance, measurement for health monitoring is challenged by the limited connection between clinical data sources and public health surveillance systems, except in some pilot initiatives (Klompas et al., 2012a,b). As a consequence, measure results cannot reflect the richness of the data available, or information must be entered redundantly depending on the data sources drawn upon for calculation.

In many areas, moreover, comprehensive measures are lacking for high-level assessment of complex—yet easily understood—concepts. Gross domestic product, for example, is readily understood as an indicator for

the economy, representing a complex measurement algorithm generating a single indicator. Similar measures are needed in areas of health, including for social determinants, environmental health, cost burden, care quality, and care safety.

Lack of Comparability

With the health measurement landscape being dominated by measures developed and oriented around the needs and priorities of individual departments, institutions, agencies, and programs, very few measures provide insights on comparative aspects of health or performance when applied at higher or lower levels of aggregation, or even across programs at the same level. If health data on a particular issue are available at higher levels of aggregation—nations, states, groups of hospitals—it can be difficult to find timely, meaningful information about health processes, outcomes, or costs at the level of individual hospitals, health care providers, or patients. What may be useful to payers, regulators, accreditors, and others concerned with compliance and with broad mandates may be of limited utility for patients, providers, and other stakeholders for use in health decision making and quality improvement programs. Even data available for assessing similar parameters may have been analyzed or presented in ways sufficiently different to limit comparison.

Figure 2-1 illustrates the lack of comparability and consistency among measurement programs by summarizing the results from a survey of 48 state and regional measure sets. This study found that only 20 percent of

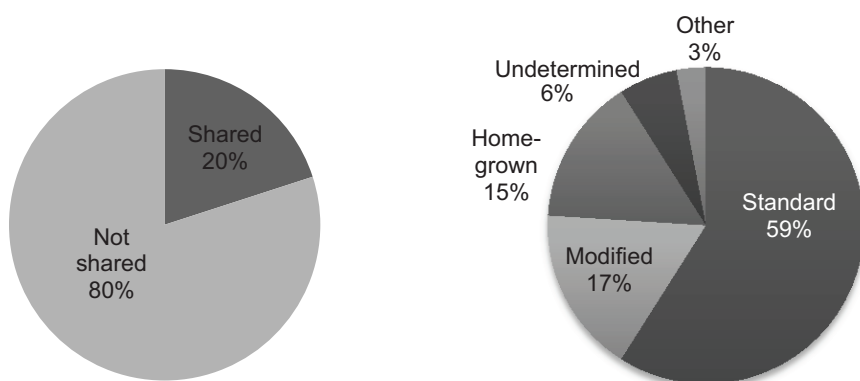


FIGURE 2-1 Properties of different state and regional measure sets, highlighting the limited alignment (left) and usage of standard, modified, and homegrown measures (right).

SOURCE: Data drawn from Bazinsky and Bailit, 2013.

measures were used by more than one program, and none of those measures were used by every program surveyed. Measure alignment is further challenged by the modification of existing or the creation of homegrown measures. The study found that more than 30 percent of measures surveyed were either modified or homegrown; 80 percent of programs had modified at least one existing measure, and 40 percent of programs had created at least one new measure (Bazinsky and Bailit, 2013).

Lack of Consistency

Various statistical and analytical challenges limit the development of reliable insights from measures across time, across organizations, and across levels of aggregation. Current measurement efforts have difficulty attributing a patient's health outcomes to a particular intervention or clinician's actions. This difficulty is due in part to the often long time lags, sometimes years or decades, between care for some conditions—especially chronic diseases—and changes in a patient's health. The same is true for population health interventions, in particular for social or environmental interventions. The time lags are long, the relationships complex, and specific attribution virtually impossible. A program aimed at preventing the development of diabetes in children would be difficult to evaluate immediately after implementation, as its effects would not be expected to manifest for several years. Moreover, it can be difficult to separate the impact of care from the impact of other health factors such as diet, physical activity levels, smoking, and substance abuse. For example, a hospital serving a relatively low-income community may have lower scores on quality measures than a hospital serving a relatively high-income community because of differences in the populations served rather than meaningful differences in the quality of care provided. At the same time, differences in quality may be at work: failure to communicate or engage patients effectively, provision of different services to those with less ability to pay, or other reasons for suboptimal delivery of care. As illustrated in Table 2-2, statistical and analytical challenges also include adjusting measures for different populations of people, attributing performance on a measure to a specific clinician or organization, and ensuring that a measure excludes patients who should not receive a given treatment or intervention. Many of these considerations are focused on measures used for payment and public reporting, although they remain applicable to other dimensions of the health system and for other uses. Further, quality measures may focus on errors of omission, in part because of payment systems that incentivize volume instead of emphasizing errors of commission, such as overutilization.

Lack of Provision for Continuous Improvement

One key challenge for health and health care measurement is to ensure that systems are in place to allow for and encourage continuous improvement as underlying technological capabilities evolve. New technologies, particularly mobile technologies, may augment measurement capabilities in diverse health care settings and should be incorporated into routine practice as they become viable. Emerging new devices can continually measure specific aspects of an individual's physical state, which can allow for a more complete picture of the individual's health status and the impact of various interventions. These evolving systems also present a challenge for total population data strategies, which often rely on telephone surveys that have increasingly poor response rates in addition to excluding subpopulations of people who use cell phones exclusively.

The expected flood of new data from these personal devices will have implications for what is measurable and how actionable different measures are. In addition, new challenges will arise—from the interoperability of different devices, to the capabilities for analysis and use of these new data, to the privacy and security of the data generated. And for mobile and non-mobile technologies alike, any measurement initiative must consider how measures will be updated and integrated as new technologies emerge.

Payment reform may also alter the landscape for health care measurement. Measurement data coupled with supportive financial incentives can be a powerful motivator for system-wide improvements. Recent payment reforms include a shift away from the fee-for-service model through the development of ACOs and other models that reward value rather than volume in health care, and they may encourage more meaningful patient-provider interactions beyond the provision of billable tests and services. At the same time, the move toward bundled or global payments could reduce the amount and type of data collected—particularly claims data—by leading to assessment of care at the event or episode level rather than at the level of individual services rendered.

Lastly, it is important to ensure that a core set of measures is forward looking and reflects continuous learning and improvement. To this end, a process is needed for continuously evaluating the utility of measures and pruning those that prove unnecessary, such as those for which near-universal compliance has been achieved, to prevent the measurement burden from increasing indefinitely. Furthermore, it is important that measurement itself be a learning system that improves over time and leverages advances in science and technology.

Limitations of Measurement for Accountability

Attempts to hold health systems accountable for their performance can pose challenges in terms of the specifications and use of particular measures and the application of measures in certain programs and projects. Many health care consumers or funders, including patients and policy makers, perceive significant potential benefits from programs that tie payment or other resources to performance on specific measures or the achievement of performance targets. From the perspective of the care system, however, there is concern that these sorts of initiatives aimed at accountability, if poorly specified, could have negative consequences or create perverse incentives.

A variety of initiatives and programs under way throughout the nation are aimed at promoting accountability through measurement. They include pay-for-performance initiatives; various federal, state, and private incentive programs; and new models for accountable care. However, the impact of these approaches is not uniformly positive, suggesting that the intuitively appealing concept of incentives for improvement may face particular challenges in the context of the health system. For example, one evaluation of a CMS pay-for-performance pilot project found that participation in the program was not associated with a significant incremental improvement in quality of care or outcomes (Glickman et al., 2007).

While programs designed to promote accountability on the part of individual institutions or providers are being developed and have the potential to lead to improved outcomes, a broader view of accountability, in which a range of providers or stakeholders are held jointly accountable for care outcomes, could benefit the care system by both improving the quality of care and encouraging coordination and efficiency in the delivery of care across the care continuum. The importance of this approach to shared accountability is highlighted in the IOM report *Rewarding Provider Performance: Aligning Incentives in Medicare*. One of the recommendations in that report is that the Secretary of HHS should be able to aggregate data across care settings to enable an incentive structure in which providers would be rewarded on the basis of shared accountability and coordination (IOM, 2007).

Limitations in Data Quality and Availability

Critical to any effort to measure performance over time or compare health outcomes or care quality across groups is the availability of high-quality, consistent standardized data. This is particularly true when measures are used for accountability purposes, either because they are tied to financial resources or decisions or because they are publicly reported as indicators of performance.

The availability of high-quality data is limited by a range of factors, including the lack of transparency and interoperability among data systems as well as the range of different measures in use for assessing similar concepts. Further, there are often disconnects between the approaches and data streams available at different levels of the health system. For example, national and state figures on health outcomes and performance often are assessed through large-scale, periodic national surveys, while at the community or institutional level, data on health outcomes may be available through individual EHRs or reporting programs. The ability to monitor the nation's health and the performance of the health system routinely and accurately will depend on the availability of high-quality data on the outcomes that matter most. Furthermore, making useful comparisons at different levels throughout the health system will require a standardized approach to data collection, reporting, and use.

Limited Measurement of Cost and Affordability

A significant challenge for the growing health measurement enterprise is the capacity to assess cost and price variation and affordability of care meaningfully and to identify sources of waste. Because of a lack of public knowledge regarding the costs of patient care and the associated outcomes, health care cost and pricing comparisons have been minimal. Cost analyses often are segregated by specialty or department level rather than over the full progression of patient care (Kaplan and Porter, 2011). As a result of this ambiguity, data on cost are limited and inadequately organized to meet the needs for consumer choice (RWJF, 2012).

Affordability is also a concept with a malleable definition. There are two generally accepted methods for measuring affordability: one relies on the ratio of expenditures to total household resources and the other on residual income after expenditures (Niens et al., 2012). Often data-intensive, these methods depend on extensive surveys and longitudinal studies. Given the relatively short supply of cost data, these measurement approaches rarely are applied to health care affordability.

The lack of transparency of cost and price information also presents a significant challenge. Prices for individual services vary widely across the nation and even among health care institutions serving the same locality. Additionally, the dollar amounts paid by patients and insurers are not disclosed consistently or accessibly, partly because of concerns about competitive advantage or disadvantage. A recent study on commercially insured patients found that on average, patients who looked at data on cost and quality saved \$139 per medical visit, indicating that access to data on price and quality can lead to shifts in consumer care as well as quantifiable savings (Whaley et al., 2014).

Programmatic Distortions

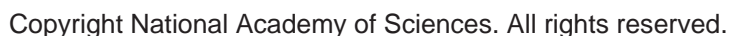
Faced with responsibilities to acknowledge, collect, and assess measures that often are focused on organizational processes rather than meaningful results, program administrators may find it difficult to direct their attention to the most productive activities. These programmatic distortions may have unintended consequences. For example, a poorly specified performance measure could lead clinicians to select healthier patients or avoid less healthy patients (Shen, 2003). One study showed that the implementation of public report cards on coronary artery bypass graft in New York was associated with increased disparity in the use of this procedure between white and black or Hispanic patients (Werner et al., 2005). Considering and accounting for these potential unintended consequences is critical to ensuring that measurement leads to improvement in health and health care.

Furthermore, many measures today fail to reflect factors important to patients. Patients often are interested in the outcomes of their care and how it will impact the length of their lives, their quality of life, and their overall functioning and well-being. Yet many public reporting sites focus on performance for specific clinical processes. If measures are not centered on the most important concepts, improvement will be elusive (IOM, 2006; Werner and Asch, 2007).

Growth in Requirements and Narrow Focus

The steady proliferation of measurement reporting, both voluntary and mandatory, has led to the collection of thousands of measures, most of which are related to processes of care. The impact of these activities on patient outcomes and the health of the general population has been somewhat limited. Figure 2-2 presents a schematic, including highlighted patient safety measures, to illustrate the growth of measurement in health and health care and the emergence of many variations for similar targets. Many of the measures in use today are collected in isolation with no context beyond a particular patient group, care delivery process, or organization. As a result, health and health care measurement falls short of its potential as a tool for analysis, comparison, and improvement across the various levels and components of the health system.

Many of the individual measures in use today were developed and implemented for a particular purpose or circumstance. The response to these initiatives has streamlined health care processes and led to significant progress on some of the most important clinical problems. For example, the implementation of checklists for central line placement has resulted in a significant reduction in blood stream infections (Hartman et al., 2014; Pageler et al., 2014; Ranji et al., 2007). Yet the focus of measurement remains quite



narrow, often targeting specific screening and documentation activities or care delivery for specific diseases or conditions.

THE MEASUREMENT BURDEN

An unanticipated outcome of the rapid growth in measurement of quality, safety, and value in the health care system has been the concomitant growth in administrative burden. The 2000 release of the IOM report *To Err Is Human* and the 2010 passage of the ACA both resulted in an increase in reportable quality measures (IOM, 2000; Panzer et al., 2013). A 2006 study of a sample of hospitals found that each hospital reported to an average of 5 programs, with the authors identifying 38 unique reporting programs among this sample of hospitals (Pham et al., 2006). And a 2013 analysis found that a major academic medical center was required to report more than 120 quality measures to regulators or payers, and that the cost of measure collection and analysis consumed approximately 1 percent of net patient service revenue (Meyer et al., 2012).

Not surprisingly, then, measurement activities often are viewed as a generally unquantified, underappreciated, and undercompensated burden for the U.S. health care system and its various stakeholders. As noted above, measure requirements often are overlapping or redundant. The result can be additional administrative burden with monetary and time costs but with no added value. This burden includes the time a patient may spend filling out questionnaires, providers entering quality data for Patient Quality Reporting System (PQRS) payment, hospitals reporting for accreditation or Leapfrog participation, and public health organizations reporting throughout the state and federal governments. The development and maintenance of the digital infrastructure needed for managing data also can create additional administrative cost and burden. Excess administrative costs due to measurement and a range of other activities are estimated at \$190 billion per year, and continually expanding measurement activities and requirements could cause this figure to increase (IOM, 2012). Altogether, the development and validation of measures; the collection, analysis, and maintenance of measurement data; and the reporting of measures have grown increasingly burdensome, with significant financial impact.

Implications for Care Organizations

Without reorientation, the proliferation of measures is likely to continue, with associated opportunity costs impacting the ability to meet other needs in the health care system. A variety of consequences could result, including the erosion of internal measurement activities and inefficient approaches to improving on measures without improving the measures'

underlying targets (Meyer et al., 2012). Given the substantial time, effort, and resource demands of these activities, it is essential to ensure that they focus on the most important opportunities for improvement and do not divert attention from higher health priorities.

In addition, more concrete financial risks are associated with the current environment of measurement and reporting. The use of measurement by multiple stakeholders in the health system has shifted it from a voluntary activity to one that is mandatory or, at a minimum, one with associated financial implications. Pay for reporting and value-based purchasing are examples of CMS programs involving financial penalties for nonreporting. Financial implications also exist for the Meaningful Use incentive program for EHR implementation (with anticipated non-reporting penalties beginning in 2015). In the current financial climate of health care organizations, the financial risks of nonreporting can be significant.

Preliminary results from a survey of leadership in 20 health care organizations, ranging in size from 180 to 3,000 beds, suggest that measurement activities may require the equivalent of 50 to 100 full-time employees, at estimated costs ranging from \$3.5 to \$12 million per year. While the providers consulted in the development of these preliminary findings believe that quality reporting is valuable and should continue, it was also suggested that reporting large numbers of measures may be overwhelming, such that resource-intensive reporting activities may crowd out efforts to improve based on the data produced (Dunlap, 2015).

Beyond the costs of infrastructure, personnel, and information technology associated with measure reporting, there is an additional risk of cost to reputation. Hospitals increasingly are being rated by national organizations, including the Joint Commission, Health Grades, and *U.S. News & World Report*, based on quality and safety measures, with significant financial implications. Reputation and brand are important marketing tools for organizations, and a failing grade on these proprietary report cards can directly impact hospital volume and revenues. Poor ratings can have indirect financial costs as well, impacting recruitment of faculty and residents, potential for research funding, magnet hospital status, and community standing.

Impact on Clinicians

Opportunity costs are high for busy practitioners faced with the increasing burden associated with measure reporting, as it directly impacts their time to spend with patients. CMS's PQRS, initiated in 2007, offers incentives for hospitals and individual physicians and their equivalents to enter data on generally process-related quality measures. In part because of the high opportunity costs entailed, fewer than 30 percent of eligible

professionals have been participating in the PQRS (Berenson et al., 2013). Other explanations involve the economics of physician practices: CMS's incentive payments account for only a minimal percentage of their revenues and are less important to them than to hospitals in the absence of the latter's high overhead. However, as penalties begin to accrue to practices in the form of decreased payments from payers, greater involvement in the PQRS and other reporting programs may occur. For large practices, measure reporting entails further costs for outsourcing of data entry, while smaller practices often use internal billing staff or physicians themselves for data entry.

The ACA initiatives emphasize measures for organizations and individual clinicians, but the process of prioritization has lagged, so that individual practitioners have been slow to participate. They often perceive quality management and measurement as arbitrary and of marginal relevance to their patients, little more than busy work. Rewards emphasize compliance over quality, and clinicians often perceive limited control over factors impacting the data, including social environmental factors, that are beyond their realm of direct influence (Cassel and Jain, 2012; Rosenthal et al., 2004).

Efforts are now under way to improve the collection of data and the alignment and reporting of measures (Conway et al., 2013; Higgins et al., 2013). For individual practitioners, CMS is sponsoring payments for participation in both the PQRS and the EHR incentive programs. ONC has begun an initiative to define standards for sharing data and partnering with the private sector to enable the needed technology for decision support capabilities. In 2012, HHS established the Measurement Policy Council to reduce the reporting burden by aligning measures across agencies.

Core Measures and Reduction of Burden

In the face of the paradox of the proliferation of measure requirements and deficiencies in health and health care performance, the potential utility of a core measure set lies in its ability to address both issues. Measurement is necessary to understand the current state and performance of health and health care, and necessarily involves costs in terms of time and resources. However, the costs and benefits of measurement activities are difficult to quantify. Many powerful, high-quality measures are already in use, but the lack of alignment and coordination discussed above limits their potential. Core measures will not displace measurement activities needed to guide specific organizational priorities, performance improvement activities, and decision making, but properly used, they should substantially streamline and harmonize reporting responsibilities and enhance system performance. As the understanding of health and health care expands beyond independent

services to an interrelated health system, measures that account for broader system performance and the alignment of the contributing components are key.

Progress in chronic disease is illustrative. A common concern for current measurement efforts is their poor applicability to complex chronic diseases whose treatment involves multiple practitioners and is heavily influenced by factors beyond the control of practitioners. Chronic illness now affects 45 percent of the U.S. population. Diabetes, for example, occurs in 8.3 percent of the population and accounts for one-third of all hospital stays in California (Meng et al., 2014; Ward and Schiller, 2013). By evaluating factors beyond a specific disease or process, core measures can better represent the complexity of patients in an accessible way. The measures themselves do not become the gold standard in care but focus on the many aspects of care for a disease. AHRQ, for example, currently reports 84 measures involving diabetes care or screening, many, such as HbA1C measures, involving specific characteristics or groups of patients (AHRQ, 2013). While helpful for defining best practice standards for HbA1C levels, these measures represent only one of many dimensions of diabetes care leading to good health, including blood pressure monitoring, weight and diet education, personal blood glucose testing, and ophthalmologic and podiatric surveillance. To avoid the natural tendency to focus on physiologic parameters at the expense of broader dynamics, patients with diabetes could instead be monitored on the key elements of the core measures, including healthy behaviors, receipt of preventive services, affordability of care, and their own and their community's engagement with their health care.

A conceptual aim of payment reform is to link financial incentives to performance at the population level. Achieving this aim will require the availability of core measures that reflect the overall status of the health system, with process measures being left substantially to the discretion of individual organizations, for internal use in improvement efforts. Measuring “door to CT scan” times for stroke patients, for example, provides institutional data useful for managing hospital triage and patient flow so as to optimize time from door to thrombolysis. From a health system perspective, however, most important is the outcome of care for stroke and the relation of the outcome to the various processes involved in diagnosis and treatment within the health care system. Such measures might also include the cost of stroke-related services (measured as total cost of care) for individuals and populations. For the creation of a parsimonious core measure set, the latter indicators have broader utility than the process indicators used by particular hospitals to improve their operations.

Reporting of standardized core measures can therefore help elevate organizational perspective from individual processes to measures more meaningful to patients. Developing and broadly sharing such measures can help

improve patients' participation in their care as well as related outcomes, as patients see the relevance of the measures to their own lives. For example, a 70-year-old woman with hypertension, obesity, and recently diagnosed diabetes may be less likely to be a "no show" if the circumstances of her care have been shaped by stronger provider and community focus on such core matters as access to care, care match to patient goals, self-management initiatives, personal spending burden, and community support. Ways to improve the impact of measurement are the focus of Chapter 3.

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3

Improving the Impact of Measurement

When the health landscape is replete with measures that are too numerous, poorly designed, of limited comparability, and sporadically accessible or applicable, the result is a dilution of focus and an overly burdensome set of requirements and processes that run counter to the basic aim of measuring what matters most. Responding to this challenge means developing a more focused system of measurement; bolstering those measures most critical to understanding and improving health; and downgrading or eliminating measures that are redundant, inaccessible, inaccurate, or impracticable. In setting out to identify a core measure set, the Committee explored the ways in which targeting core priorities can accelerate change, identified criteria for a core measure, developed criteria for a core measure set overall, and considered lessons learned from examples of existing sentinel measurement efforts.

Complexity and rapid proliferation present a significant challenge for health and health care measurement. While health care has the capacity to test and measure almost countless aspects of a patient's condition, careful consideration is necessary to avoid a strategy that is costly, dangerous, and inefficient for the patient. Similarly, the rapid proliferation of measurement activities within the health system without thoughtful consideration and planning for priorities, focus, and coordination fails to capture a meaningful, actionable picture of the U.S. health system.

A core set of measures centered on what matters most could be utilized through a variety of pathways, leveraging multiple stakeholders and stakeholder coalitions. In the context of the broad range of health determinants and the various policy and program levers at work, often wielded

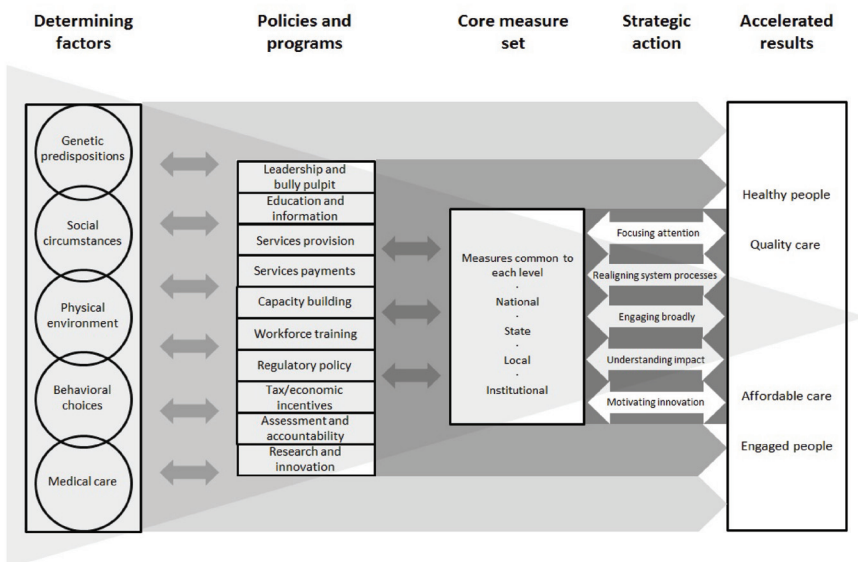


FIGURE 3-1 Core measures as levers for enhancing the impacts of the key determinants of health.

by semiautonomous, siloed stakeholders, the natural tendency is toward fragmented intentions, focus, and activities. Figure 3-1 outlines several potential pathways through which core measures, individually and as a set, could accelerate progress, acting to sharpen the focus of programs and policies in shaping the intersecting impacts of the key determinants of health (McGinnis, 1985; McGinnis et al., 1997, 2002).

A parsimonious, standardized set of measures collected regularly and consistently across the nation could enhance the ability of health care leaders and the public to track progress toward shared goals and to work in collaboration to achieve standardization and interoperability in measurement and data systems. If the same set were implemented at the national, state, local, and organizational levels, these benefits would be multiplied as a result of the enhanced ability to make comparisons and determine best practices. While each of the measures in a candidate core measure set could be used for a variety of purposes, the set as a whole would have specific applicability for measuring health, with each measure offering complementary and mutually supportive pathways to improvement.

CHANGE AS A PRODUCT OF TARGETING THE CORE ISSUES

Measurement in health care is a tool for improvement, not an end point or a solution in itself. The diversity of the current range of health measures is a reflection of the wide variety of purposes and targets within health care that have the potential to be empirically assessed and systematically monitored or compared as a route to improvement (see Chapter 2). A core measure set is not intended to replace the full range of measures in use today. Rather, a core set can raise the profile of the most compelling health challenges facing the nation; draw attention to issues and actions that can trigger broader-scale system improvement; provide a platform for harmonizing efforts to monitor national, state, local, and institutional progress in health and health care; create opportunities for alignment and the resolution of redundancies in areas in which measurement is burdensome; and guide the creation of a more robust multilevel data infrastructure. Focusing attention primarily on the results of core interest but not prescribing the precise measures to be used to ensure progress toward those outcomes will encourage organizational attention to focus on the most important issues, limit the formal reporting burden, and ensure that other performance improvement measures are tailored to local needs and interests.

Focusing Attention

As discussed in Chapter 2, focusing attention on key outcomes with the potential for broad improvement can enable the orientation of measurement efforts around the outcomes that matter most, reduce the propagation and required reporting of secondary measures, and thereby help reduce the burden of measurement. A core set of performance measures draws attention to the high-priority issues most important to improving health, improving care, lowering costs, and engaging people. Too large a number of measures could distract attention, and thereby dilute the consideration of any particular metric, whereas a parsimonious core measure set can focus attention on the highest priority targets for improving health and health care. Often, the large number of measures used by an institution or community represents inefficiency in the collection of data, driven in part by competing reporting requirements around similar concepts. For example, payers—including private payers, Medicare, and Medicaid—currently are using different measures in their payment incentive programs (Lee et al., 2010). However, clinicians generally do not provide different types of care to patients based on the health plan in which they are enrolled (Baker, 1999; Glied and Zivin, 2002). Multiple sets of different measures may work at cross-purposes by dividing providers' attention and thereby limiting their ability to significantly improve care in the measured areas.

Realigning System Operations

Core measures can encourage consideration of broad, interacting forces and reorientation of the interplay between health systems and leadership to enable decision making aligned with the goal of improving health outcomes as efficiently as possible. Measures provide a window into the performance of complex systems, and the quality, accuracy, and importance of what they show can play a role in determining what steps are taken or what strategies are adopted. A poorly specified measure may lead a health stakeholder to make changes where none are needed or to overlook a significant problem that may not have been captured quantitatively. The management dictum “what gets measured gets done” captures this critical role of measurement in directing productive action.

Similarly, a common set of measures allows variations—whether among different geographic regions, clinicians, or treatments—to be identified and leveraged. For example, a common measurement framework in cardiac surgery allowed one organization to identify variations in clinical outcomes among different providers and then to share the best practices from high performers throughout the organization (IOM, 2013). Others have found that public reporting of performance measures can help organizations identify areas that need improvement and track improvement over time.

Engaging Broadly

Core measures may rally the support and involvement of diverse coalitions of stakeholder groups seeking to improve health and health care, as well as encourage and empower engagement at different levels within an organization, from leadership to facilities and operations. The different partners involved, which might include county-based health departments, health care delivery organizations, community-based organizations, and employers, will have different ways of collecting and storing data and different perspectives on the most pressing areas for improvement. Core measure sets can help these diverse groups work together by defining a common target for improvement and identifying the areas in which data need to be collected and shared. Core measures can also highlight areas of greatest urgency for the health system as well as compelling opportunities for change. In this way, core measures can effect broader alignment at the local, state, and national levels for improving health and care.

Understanding Impact

In addition to engagement, core measures can enable a deeper understanding of the forces at play in America’s health. For example, core

measures can allow for improved health monitoring and tracking over time. Many health care organizations today find themselves contending with the need to adjust frequently to new reporting requirements from multiple sources such that data are not necessarily comparable from one cycle or year to the next or from one organization to the other. This issue is especially problematic when one is considering health outcome measures, as effects may be seen only years or even decades after an intervention. A well-specified and -maintained core measure set can bring relative permanence and consistency to monitoring of the health system, such that meaningful comparisons can be made not only among regions and systems but also across time. This functionality can allow for stronger, more meaningful analysis of which approaches and initiatives are making a difference, as well as enable the health system to broadly recognize high performance and, in turn, replicate the most successful programs and policies.

Systems Approaches and Composite Measures

Composite measures and scores represent a potentially powerful tool for managing complexity in assessing health and health care performance. The 2006 IOM report *Performance Measurement: Accelerating Improvement* discussed composite measures as an approach to integrating performance monitoring across multiple dimensions and, by extension, improving the quality of the information gleaned from performance measurement (IOM, 2006). The prioritization of efficiency in the collection and use of information is also reflected in the principles of systems theory and lean management systems. These management approaches, which were initially cultivated in the manufacturing sector, have since been incorporated and applied in a wide range of industries, including health care.

Lean management, as its name suggests, emphasizes reducing waste and streamlining processes. A critical component of this streamlining is the prioritization of process points that contribute the most value to the final product, which, in the context of the health system, is better health (IHI, 2005). As such, identifying those measures that convey the most meaning and drive the most improvement in performance is both a key element of applying systems thinking to health and health care and a potential role for core measures.

While the number and diversity of health measures is reflective of the complexity of patient needs and characteristics, not all measures contribute equally to improving health. An analysis of the net health benefit of 13 different Agency for Healthcare Research and Quality (AHRQ) quality indicators found that 7 of these measures accounted for 93 percent of total benefits, while the remaining 6 measures accounted for only 7 percent of total benefits (Meltzer and Chung, 2014). Identifying those measures with

the largest value-add for health will require significant research and analysis, and the measures needed are likely to evolve over time with changes in health and health care. The use of composites that combine multiple elements with varied weights could enable reporting and performance measurement activities to be more responsive to these changes through adjusting individual elements of composites rather than continually adding new measures to existing activities.

A variety of composites or “scores” have been proposed as potential alternatives to the trend of continually adding new measures and new complexity that may not result in improved information. For example, one recent proposal called for a measurement system that would present a whole-person view of health, while remaining adaptable and flexible for different medical specialties, different patients, and different care settings. An individualized care quality score, in this approach, could be derived from three components: (1) an inventory of patient care needs, (2) a tool for matching those needs with evidence-based care approaches, and (3) patient preferences and health goals (McGlynn et al., 2014). In this way, a single composite score could be used to provide information about multiple facets of care quality and patient experience. This approach to integrating a variety of elements into a single measure or score is also seen in a variety of health and health care reporting activities, such as The Commonwealth Fund’s State Scorecards and the County Health Rankings (McCarthy et al., 2009; RWJF and UWPHI, 2013).

Motivating Innovation

Finally, core measures can encourage broader thinking about ways to impact the forces and elements that underlie health, potentially leading to innovation in approaches and interventions that can improve outcomes. Core measures have a symbiotic relationship with data sources: while data sources are used to calculate core measures, core measures can be used to guide the creation of a robust, rational digital infrastructure. A core set of measures can be used to identify the necessary data elements that a data system should capture as part of routine operations. For example, the Vermont Blueprint for Health used core measure sets to identify the necessary data elements that its electronic health record systems should capture during routine care. In this case, the core set of measures served as the basis for a data dictionary around which the electronic health record system was designed. The resulting system was then able to collect and export these key elements, populate the core measures in a dynamic fashion, and ensure transmission and exchange of the key data elements. Similar principles can

apply to other data systems, from multi-payer claims databases to health surveillance systems.

CRITERIA FOR A CORE MEASURE

In preparation for identifying criteria for a core measure set, the Committee discussed what key characteristics would be most critical to its usability and impact. This discussion included a review of criteria used by other groups to assess and compare health measures. These criteria include the importance for health of the issue addressed by a measure, the strength of the measure's linkage to progress on that issue, the understandability of the measure, the technical integrity of the measure as an indicator of the targeted issue, the potential for broader system impact, and the measure's utility at multiple levels of focus. Criteria for core measures and for a core measure set (discussed in the next section) are presented in Box 3-1.

Importance for Health

The foundational factor that the Committee considered in its vision for a core measure set was that the issues addressed by the measures should represent the highest-priority issues for improving the nation's health at every level—from the individual to the overall population. Therefore, the Committee sought to craft a core measure set that would accurately reflect the state of the nation's health and its health system, highlighting its strengths and, of greatest value, its weaknesses. In this respect, emphasis was given to those issues associated with the greatest health-related societal burden and the component elements of those issues with the most direct potential to make a difference. Focusing measurement on what matters most is a critical prerequisite for progress.

BOX 3-1 Criteria for Core Measure Development

Criteria for core measures

- Importance for health
- Strength of linkage to progress
- Understandability of the measure
- Technical integrity
- Potential for broader system impact
- Utility at multiple levels

Criteria for the set

- Systemic reach
- Outcomes-oriented
- Person meaningful
- Parsimonious
- Representative
- Utility at multiple levels

Strength of Linkage to Progress

The Committee envisions core measures as a tool for driving progress toward better health, better care, lower costs, and engaged patients and communities. Accordingly, another critical feature of a core measure set is a strong linkage to progress. Not only should the measures selected reflect the most critical issues at present for the health of the public; they should also be able to show progress over time toward key aims, such that any improvement in the results of core measures should indicate as clearly and directly as possible a real, meaningful advance in the performance and quality of the health system and, more broadly, the health of the public. For some measures, for example, current performance may already be at a high level, such that additional investment in monitoring and improving may be of limited value. An outcomes-based approach allows the measurer to remain agnostic to the strategy or type of intervention used for improvement and engagement and to focus instead on whether results are achieved. But whether a core measure is oriented to a process or an outcome a strong linkage between processes and outcomes and between measures and progress in health is a key requirement.

Understandability of the Measure

The Committee concluded that if a core measure set is to be relevant and meaningful to the full range of health system stakeholders, the content, language, and presentation of the measures must be accessible to a general audience. Thus, the Committee envisioned a core measure set that would be easily understood such that the meaning behind the numbers would be immediately apparent for all stakeholders, from statisticians and measure developers to students, patients, and other individuals. For example, HbA1C is a common metric for diabetes care, but its meaning is not readily apparent to a nonexpert audience. Understanding and relating to such measures as self-reported health status and satisfaction with patient–clinician communication does not require significant background or expertise.

Technical Integrity

Basic to any measurement activity is a measure’s technical integrity—that is, the evidence in support of its reliability as a true reflection of the state of the targeted issue, the robustness of the validation process in its support, the practical ease and likely consistency of its application, and its requirements for statistical power under anticipated use. Distortions on any of these dimensions can negate the measure’s utility or even introduce adverse and unintended consequences. Technical integrity of the measure

chosen is its validity, construct, applicability, and statistical power in practical use. As a core measure set for broad-scale use, the development, testing, and application of candidate measures is critical to ensure their technical integrity.

Potential for Broader System Impact

Selecting a small number of measures to represent health at large requires that each measure selected have the capacity to demonstrate and promote progress and change across a range of issues, perspectives, and stakeholder groups. By targeting high-level health outcomes important to a broad range of stakeholders, measures can catalyze improvement across the nation through the alignment of critical stakeholders, from clinicians, to patients, to payers, to employers, to government officials at many levels. While a clinical process measure can bring a care team together around a shared goal, an outcome measure can bring a community or a state together to tackle a complex problem with numerous potential approaches and leverage points. For example, a health care system can measure body mass index (BMI) among its patient population, but making progress toward reducing overweight and obesity calls for the active involvement of communities, schools, employers, and other key stakeholders that play a role in healthy behaviors.

Utility at Multiple Levels of Focus

Any measure selected for a core set should have meaning and relevance at multiple levels. Thus, it should be possible to readily translate a national core set of measures to a state, regional, local, or institutional core set that, while translated to local circumstances, measures progress toward goals measured by the national set. This feature of usability at multiple levels is critical for advancing the ultimate development of a fully interoperable, scalable set of core measures. For example, a measure such as self-reported health status can be implemented for populations at multiple levels, from a small community to the nation as a whole, and the concept of wellness represented by this measure is highly relevant for stakeholders both within and external to the health care system.

CRITERIA FOR THE CORE SET

Building on lessons learned from previous initiatives to select core measures, the Committee developed criteria for the core measure set to guide the selection process. It is important to note that these criteria are intended to apply to the set of measures as a whole, not to the individual measures

within it. Additional considerations are needed to construct a high-quality set of measures. Because few organizations have proposed characteristics for a core set, the report focuses its work on criteria for a core set of measures by identifying key attributes that a set as a whole should possess in order to achieve its aims. The core set taken as a whole needs to reflect as much as possible what health care providers, policy makers, business owners, patients, and members of the public view as their overarching goals for health and health care. These criteria, also listed in Box 3-1, are described below.

Systemic Reach

A core measure set needs to capture not only progress on the specific measures it includes but also progress on overarching, meaningful priorities for health across the health system, touching on the full range of actors and stakeholders involved and driving improvement throughout. Further, the core set should be specified such that, taken as a whole, it can capture improvement in performance that indicates meaningful change occurring in the health system and in communities. For example, a core measure set could focus on a particular population, such as Medicare or people with chronic conditions. However, the scope of this core set would be limited, as would its relevance and interest for many stakeholder groups.

Outcomes-Oriented

The Committee concluded that a well-constructed core measure set would focus on outcomes of good health rather than on the processes that might lead to those outcomes. Thus the core set should be agnostic to the route or strategy taken to achieve improvement, encouraging innovation in addressing the highest-priority health problems. Further, a core measure set orientation to outcomes, while importantly incorporating selected process elements, is likely to be a more direct measurement of what a strategy for improvement is intended to achieve. For example, “aspirin at arrival” for acute myocardial infarction is often used as a hospital care quality measure, as it assesses whether clinical standards are being followed in care for a relatively common admission. However, this measure addresses only one element of the broader picture of cardiac care, emergency care, or cardiovascular risk factors; by contrast, outcome measures focused on mortality, readmissions, or management of chronic diseases and risk factors provide a broader view that does not emphasize a particular clinical action or care setting.

Person Meaningful

An ideal core measure set will be readily comprehensible and meaningful to a wide range of stakeholders, most critically to lay individuals, including patients and families. This criterion represents a challenge both for the content of the core measure set and its expression and communication strategy. The intent of each measure should be readily apparent to a non-expert audience, and the core set as a whole should make a clear statement about the health system's priorities and current performance. For example, a standardized infection ratio for a hospital-acquired infection provides meaningful information about patient safety but is not well understood by the general population; therefore, it does not meet the criterion of being person meaningful.

Parsimonious

A core measure set should comprise the minimum number of measures needed to assess health and health care. Meeting this criterion requires balancing the goals of efficiency and comprehensiveness. Thus, while there is no "right" number of core measures in a set, the Committee worked to identify the smallest number of measures possible and assessed the set as a whole based on the extent to which it balanced the need for comprehensive coverage of the most important health issues and efficiency of expression. The Committee also set basic benchmarks for parsimony, concluding that a set of 50 or 100 measures would be too large to be accessible and meaningful, while a set of fewer than 5 would be too limited to provide a comprehensive view of the health system. Balance, synergy, and representativeness (below) are key to the impact.

Representative

Just as critical as the number of measures is the extent to which they represent the most critical issues and priorities of the American health system. As such, the Committee evaluated the core set using the criterion of "representativeness," or the extent to which the core set reflected health realities. For example, while care for rare diseases is an important area for improvement in the health system, it does not meet the criterion of representativeness because it represents only a small population of both patients and providers and has limited implications for the elements of health that lie outside of the care system.

Utility at Multiple Levels

The measure set as a whole should be useful and relevant at multiple levels of aggregation, from the individual to the national level. The importance of this criterion was discussed above in the section on criteria for individual measures. It is also important to consider how measures interact with each other in a set and how the full set represents or excludes different subpopulations. For instance, a high-quality set could be constructed that assessed care for diabetes and heart disease, yet that set would exclude many people in the population and many parts of the broader health system. The challenge is to construct a set that captures progress toward improving health and health care for the widest possible range of people and throughout the health system.

RELATED EXPERIENCE WITH SENTINEL MEASURES

Core measures serve the purpose of sentinel measures because they capture the ability of the health system to meet critical societal goals and to produce highly valued outputs system-wide. Improving performance on core measures will have far-reaching implications for system and societal health care performance. Some sentinel measures are identified as the best indicator of progress in a particular disease or treatment domain, for example, the reduction of teen pregnancy is an indicator of progress in reproductive health. Improvement on other sentinel measures—that is, measures including core measures that are intended to drive improvement—reflects broader systemic changes: for example, progress against maternal mortality in the early 20th century was associated with the overall improvement of public health capacity and led to the coining of the term “sentinel indicators” (Rutstein et al., 1983). The Committee considered a wide range of sentinel measurement initiatives throughout its deliberations, and drew on lessons learned from these experiences. Box 3-2 lists the sentinel measurement initiatives that the Committee considered closely in its review, and these measure sets are also reproduced in full in Appendix D. Figure 3-2 illustrates the heterogeneity of measurement areas and topics covered by these sentinel measurement initiatives.

Because experience with sentinel measures is relevant to the potential impact of a core measure set, the Committee assessed several efforts to develop such measures. In particular, the Committee identified areas of commonality in these efforts as well as differences among them both in the content of the measures and in implementation and dissemination. Appendix D presents a catalog of prominent core measurement initiatives, illustrating areas of convergence and divergence. While neither a census nor a representative sample of current core measurement-related activities,

BOX 3-2

Sentinel Measurement Activities Considered

- ASPE Health System Measurement Project
- Blue Cross Blue Shield of Massachusetts: Alternative Quality Contract
- Buying Value Coalition: Buying Value Ambulatory Core Set
- Canadian Institute for Health Information: Canadian Health System Performance Measurement
- CDC Surveys (e.g., NHANES, NHCS, NHIS, NVSS)
- CMS: Health Homes Core Measures
- CMS: Medicaid Adult Health Care Quality Core Set
- CMS: Medicaid/CHIP Children's Health Care Quality Measures (2013 Set)
- CMS: Medicare Advantage Rating Measures
- CMS: NQF Evolving Core Measure Set for Dual Eligible Beneficiaries
- CMS: Shared Savings Program (ACOs)
- The Commonwealth Fund: Why Not the Best?
- Consumer Reports Health: Hospital Quality Measures
- CQO Roundtable: Illustrative Set of Quality, Outcome, and Cost Measures
- DOD: Military Health Service Strategic Imperatives Scorecard
- HHS: Leading Health Indicators for *Healthy People 2020*
- HHS: National Quality Strategy Measures
- HRSA: Core Clinical Measures
- IHA: P4P California Core Measure Set
- IHI: Measures for Triple Aim Communities
- Joint Commission: Accountability Measures
- Joint Commission Example: Acute Myocardial Infarction Core Measure Set
- Leapfrog: Hospital Safety Score Methodology
- NCQA: HEDIS Measures (Health Plans, 2013)
- ONC: Meaningful Use Clinical Quality Measures for Eligible Hospitals (2014)
- ONC: Meaningful Use Clinical Quality Measures for Providers (2014)
- Oregon Health Authority: Coordinated Care Organization Core Measures
- Patient-Centered Medical Home Evaluators Collaborative
- Premier: QUEST Measures
- State of California: Let's Get Healthy California
- State of Massachusetts: Standard Quality Measure Set
- State of Minnesota: Statewide Quality Reporting and Measurement System
- State of the USA Health Indicators
- State of Vermont: ACO Core Measure Set
- UnitedHealth Foundation: America's Health Rankings
- University of Wisconsin: County Health Rankings
- Veterans Health Administration: ASPIRE Measure Set
- World Health Organization Millennium Development Goal Scorecard

NOTE: Selected measure sets are not intended to provide a complete list or a representative sample. These measure sets are reproduced in full in Appendix D.

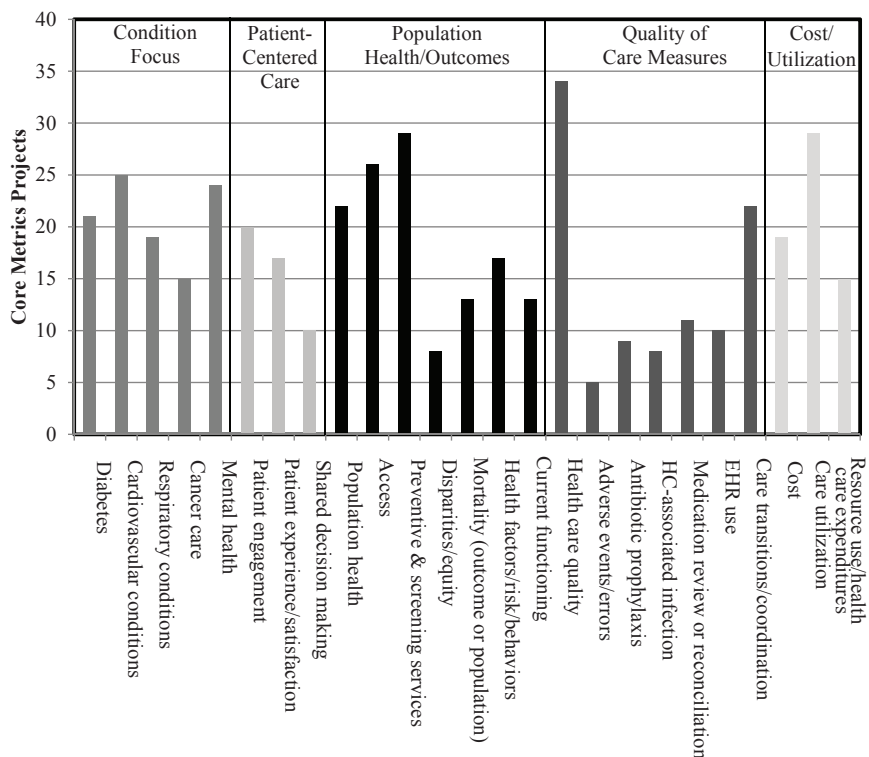


FIGURE 3-2 Number of sentinel measure initiatives on topics in five key areas.
NOTE: EHR = electronic health record; HC = health care.

it does illustrate the range and heterogeneity of sentinel measurement efforts already under way. Although not all of the examples may reflect the selection of measures that are truly sentinel, Box 3-2 presents a number of core measure initiatives that identified a limited set of measures from a larger pool. The initiatives displayed represent a variety of areas, from diabetes to cost and utilization, and they also reflect significant variation in the number of measures included in each set, ranging from as few as 10 to more than 100. Appendix D also provides further detail on the types of measures included in these measurement initiatives, including their focus and the concepts assessed, in the form of a table identifying the relevant foci of different initiatives.

Example Cases

In the Appendixes and related material, significant activity is reflected ongoing in the field to improve the quality, reliability, usefulness, and transparency of health measurement. This includes not only efforts to align and prioritize measures, as discussed above, but also efforts to develop and implement better measures and to achieve meaningful results through targeted measurement activities. Four examples are described below.

Using Measurement of Total Cost of Care to Reduce Overall Costs

The Network for Regional Healthcare Improvement (NRHI) is coordinating a project that illustrates the type of measure development that, in the Committee's view, is needed to ensure that measures in use reflect a broad range of factors in and influences on health and provide a high-level view of the state of different aspects of health. The aim of this project is to identify the drivers of regional health care costs and develop strategies for reducing spending at the community level. The results of this work have the potential to inform future efforts in regional and national cost reduction. They also should help future Regional Healthcare Improvement Collaboratives (RHICs) create similar reporting systems for total costs of care and resource use that could be used in their communities to create a business case for payment reform, value-based benefit design, and changes in the organization and delivery of health care. This project, funded by the Robert Wood Johnson Foundation, will be conducted over an 18-month period and will explore a common measurement standard for costs and resource use across the participating regions. The partnering RHICs will create a benchmark to permit comparison of commercial costs and resource use both within communities and across regions, and they will engage in multi-stakeholder dialogue to further understand the results and devise with ways of using this information to reduce costs. Focused efforts with physician partners will lead to the creation of a curriculum for teaching physicians how to leverage the results to develop strategies for reducing costs. The project is developing a physician leadership curriculum to train and support physician champions to lead the movement toward cost transparency. The project will culminate in a national summit that will review the results of this research and its national implications.

The project will work to implement the measure set for total cost of care and resource use developed by HealthPartners. This measure set was chosen because it is a public set for which substantial documentation is available on the HealthPartners website, and it has been endorsed by the National Quality Forum (NQF).

In the initial planning phase, the five participating partner organizations of NRHI were brought together to identify the issues for which standardization is most important. One issue identified early on was risk adjustment, as the method used for risk adjustment determines the development of benchmarks and hence the extent of comparability of measures across communities. Because some communities had already selected specific risk adjustment methods for use in public reporting, significant effort and buy-in were required across the collaborative stakeholders. After 2 months of discussion, the collaborators agreed on the use of the risk adjustment method included in the NQF endorsement. However, those communities with existing risk adjusters will continue to use them for practice-level measurement and reporting initiatives.

Because this is a pilot, it is an opportunity to assess variation, try new ideas, and understand the impact of standardization. This process highlights some of the challenges of standardization. The sites were selected to participate because of the adequacy and availability of their data and strong alignment of local and project goals. All but one of the partner sites operates an aggregated multi- or all-payer claims database. The data included in each database vary—for example, in the number of *International Classification of Diseases* (ICD)-9 codes available—reflecting local policies. Another difference is the access to substance abuse and behavioral health data, as this type of data is highly sensitive and requires substantial data security. Yet these data are used in the risk adjustment software, and for comparability, either all collaboratives or none must use them. Another technical issue was whether to include incentive payments (such as with pay-for-performance contracts) in the total cost of care measure. The collaboratives had to resolve 22 key questions to ensure comparability, sometimes addressing a very detailed level of individual codes.

Another important consideration is the use of the data. The goal generally is to identify trends and large-scale variations, which the communities can use to identify opportunities for improvement and learn from high performers. The results can open up a conversation among the stakeholders and lead to change, with some regional employers planning to use the results for payment and benefit redesign. The project has already demonstrated that significant resources are required to reach agreement on standardization in such areas as risk adjustment and data quality.

CollaboRATE: Involving Patients in the Development of a Shared Decision-Making Measure

CollaboRATE illustrates measure development initiatives addressing patient experience and engagement and provides an example of how patients and families can be directly involved in the measure development

process. A team from the Dartmouth Institute for Health Policy and Clinical Practice working on health and health care measurement recognized the critical role of shared decision making in health, and accordingly they began developing a new type of measure targeting the patient's role in clinical decision making, called CollaboRATE. Frustrated by the absence of a patient-reported measure of shared decision making that was psychometrically sound, sufficiently generic to suit any health care encounter, and scalable, the researchers proceed to develop this new measure through active partnership with end users.

The team interviewed 27 men and women in a rural hospital setting in two phases of iterative development and refinement (Elwyn et al., 2013). During this process, three core shared decision-making tasks were identified—provision of information, elicitation of patient preferences, and integration of patient preferences in decision making—and three corresponding items were constructed to form the CollaboRATE measure. Brief pilot testing with another 30 men and women demonstrated that CollaboRATE was easily understood by users and could be completed in less than 1 minute on exit from the clinical encounter.

Subsequently, the researchers assessed the psychometric properties of CollaboRATE experimentally in an online study of a representative sample of 1,341 adults in the United States (Barr et al., 2014). Study participants were randomly allocated to view one of several animated doctor–patient encounters featuring different levels of shared decision making. They were instructed to imagine themselves as the patient in the encounter and to complete CollaboRATE and two other measures of shared decision making. A subsample was resurveyed 1-2 weeks later, when they again viewed an animated encounter and completed CollaboRATE. Under these controlled conditions, CollaboRATE demonstrated discriminative validity, concurrent validity, sensitivity to change, and test-retest reliability.

The researchers have since completed a pilot implementation of CollaboRATE among a diverse network of clinical teams in the United Kingdom, during which the measure was administered to more than 5,000 patients via a paper survey upon exit from their clinical encounter. The team also has begun a large trial to rigorously assess the psychometric properties of CollaboRATE in real-world clinical settings in the United States. Overall, the development and testing of CollaboRATE in partnership with end users demonstrates the feasibility and utility of a collaborative approach to the development of patient-reported measures and the importance of using patient-reported measures that have been demonstrated to be comprehensible to the target audience (Thompson, 2014).

California Hospital Assessment and Reporting Taskforce (CHART)

A variety of projects nationwide are developing score cards, report cards, or ranking systems to provide information about health system performance, both to inform consumers and to enable assessing and monitoring progress over time. CHART, a project of the California HealthCare Foundation, has produced a standardized statewide online report card on hospital performance and quality. Developed through the collaborative work of a broad group of stakeholders that includes hospitals, government, health plans, employers, labor unions, and consumers, the CHART report card consists of 50 hospital performance measures aligned around system-wide goals. Hospitals are rated on a five-point scale—superior, above average, average, below average, and poor—for each measure. Although the program is voluntary, it has been adopted by 240 hospitals throughout California.

One reason why the CHART report card was able to achieve this level of adoption was that it requires less administrative effort than other reporting programs. Its adoption also benefited from active community efforts driven by consumers advocating for transparency in hospital performance data. The primary barriers to the report card's implementation were the resource requirements of data collection, the selection of measures acceptable to all, and opportunity costs. Officials involved in implementation found that hospitals were most amenable to adoption when the report card was presented as an opportunity to take a proactive measurement approach in preparation for the likelihood that performance measurement would become obligatory. There is currently concern about how to align this program with new national requirements for health care performance measures to ensure that it remains effective.

Bailit Buying Value Initiative

The Bailit Buying Value Initiative, under the auspices of NQF, supported a landscape study of value and measurement in 48 states, designed to identify critical challenges and implementation efforts under way. The original goal of the project was for Bailit to develop a core measure set for use in value purchasing; however, it was decided that knowledge of whether current sets do or do not align was first necessary (BHP, 2013). Bailit found that the most critical barrier to standardization and efficiency appears to be misalignment of measure sets across states. Large numbers of measure sets were identified, and despite being drawn from similar national sources, the measure sets of individual states are either measuring different data or tailoring measures to meet state-dependent demands. The Buying Value Report is intended to describe the scope of the problem and to provide

recommendations for creating more alignment among measure sets across states and regions. Notably, the only consistently aligned measures are derived from Medicaid practices, likely because these programs primarily adopt Healthcare Effectiveness Data and Information Set (HEDIS) measures. Also noteworthy is that California appears to have better-aligned measure sets (perhaps because of the CHART program described above) compared with Massachusetts (only these two states were compared side by side). Another unique finding was that in Minnesota, legislative mandates for the implementation of recommendations from the State Quality Reporting System incentivized more alignment.

This landscape study also identified many “innovative measures,” or new measures created in lieu of the adoption of measures from existing programs. Many states develop such measures in an effort to measure in a way that is tailored precisely to their needs, priorities, resources, and populations. The study found that roughly 40 percent of states were creating such measures, and most of these were an attempt to fill gaps in measurement (e.g., care coordination, patient self-management, care management) (Bazinsky, 2014).

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4

The Core Measure Set

In identifying the core measure set, the Committee sought to balance the need for parsimony with the need for usability and applicability for a variety of stakeholders at different levels throughout the health system. This chapter describes the Committee's process for and considerations in developing the core measure set; presents the core measure set; describes the rationale, supporting evidence, and current data availability for the set; and identifies provisional data indicators as the best available reflections of the current performance levels for each of the core measures, as well as related priority measures that various groups may wish to use to provide a more granular reflection of the current state for each of the core measures. The concluding section provides an overview of processes and approaches anticipated for developing, applying, and improving the core measures over time.

APPROACH TO IDENTIFYING THE CORE MEASURE SET

The Committee considered a broad range of issues and approaches for the process of identifying and evaluating candidate core measures and the qualities of the overall set. Key considerations included ensuring that the core set would address the most critical issues and elements of the American health system, as well as meet the Committee's criteria for a core measure set presented in Chapter 3 (see Box 3-1), and choosing best current measures to be used until the processes could be set in motion to refine the measures needed for application at every level.

Addressing the Criteria for the Set

To ensure that the core measure set would be as relevant, useful, and effective as possible for a broad range of stakeholders, the Committee focused on identifying measures for the health influences, characteristics, and interventions that matter most in the domains of healthy people, quality of care, costs of care, and people's engagement in health and health care. Furthermore, the Committee considered the potential core measurement needs, priorities, and challenges for key stakeholder groups, including patients, families, and the public; clinicians; health care organizations; payers and employers; public health agencies at multiple levels; regulatory authorities; grant-making organizations; and media. In addition to the evidence base for various candidate core measures, the Committee considered the potential utility of candidate measures as tools for motivating change, with particular attention to national health priorities, the face validity of measures, the strength of their linkage to progress, their capacity to promote broader change, their technical reliability, and their relevance at multiple levels of the health system.

These and other considerations were operationalized through the development of criteria for the core set, described in Chapter 3 (see Box 3-1). These criteria served as a tool for assessing the set of measures at various stages of development and ensuring that the final product of the Committee's deliberations would accord with its intentions. At one point, for example, the Committee's core set had expanded to include more than 50 measures, which upon consideration, the Committee concluded did not meet the criterion of parsimony. Similarly, the Committee considered various process measures, such as measures of screenings or interventions for specific conditions, throughout its deliberations. However, a core set consisting substantially of process measures would fail to meet the criterion of being outcomes-oriented. The Committee also chose not to focus the set on individual diseases because other candidate measures had greater potential to spur progress as well as utility at multiple levels while maintaining the principle of parsimony.

Addressing the Criteria for the Measures







As discussed in Chapter 3, building on lessons learned from previous core measure initiatives, the Committee also developed criteria to guide the selection of individual measures: the importance of the issue addressed by a measure, the strength of a measure's linkage to progress, its face validity, its technical reliability as an indicator, its potential for broader system impact, and its utility at multiple levels (see Box 3-1). The Committee used these criteria to assess candidate measures on a three-point scale (meets criterion,

somewhat meets criterion, does not meet criterion), using the results of this process to guide changes and refinements. For example, while counseling on smoking cessation is an important clinical intervention for a particular addictive behavior, it does not meet the criterion of potential for broader system impact, as it is focused narrowly on a specific intervention within the care system. Similarly, it does not meet the criterion of strength of linkage to progress as cessation counseling alone, while supported by evidence of effectiveness, is unlikely to dramatically reduce smoking prevalence absent broader concerted efforts to address the social and cultural correlates of tobacco use and other addictions.

Choosing a Best Current Measure










The core measure set presented in Table 4-1 targets the most critical issues for making progress toward healthy people, better-quality care, lower costs, and engaged people. In many cases, these core measures will need to

TABLE 4-1 Core Measure Set

Domain	Key Element	Core Measure Focus	Best Current Measure	Current National Performance ^a
Healthy people	Length of life	 Life expectancy	Life expectancy at birth	79-year life expectancy at birth
	Quality of life	 Well-being	Self-reported health	66% report being healthy
	Healthy behaviors	 Overweight and obesity	Body mass index (BMI)	69% of adults with BMI 25 or greater
		 Addictive behavior	Addiction death rate	200 addiction deaths per 100,000 people age 15+
		 Unintended pregnancy	Teen pregnancy rate	27 births per 1,000 females aged 15 to 19
	Healthy social circumstances	 Healthy communities	High school graduation rate	80% graduate in 4 years

continued

TABLE 4-1 Continued

Domain	Key Element	Core Measure Focus		Best Current Measure	Current National Performance ^a
Care quality	Prevention		Preventive services	Childhood immunization rate	68% of children vaccinated by age 3
	Access to care		Care access	Unmet care need	5% report unmet medical needs
	Safe care		Patient safety	Hospital-acquired infection (HAI) rate	1,700 HAIs per 100,000 hospital admissions
	Appropriate treatment		Evidence-based care	Preventable hospitalization rate	10,000 avoidable per 100,000 hospital admissions
	Person-centered care		Care match with patient goals	Patient-clinician communication satisfaction	92% satisfied with provider communication
Care cost	Affordability		Personal spending burden	High spending relative to income	46% spent >10% income on care or were uninsured in 2012
	Sustainability		Population spending burden	Per capita expenditures on health care	\$9,000 health care expenditure per capita
Engaged people	Individual engagement		Individual engagement	Health literacy rate	12% proficient health literacy
	Community engagement		Community engagement	Social support	21% inadequate social support

^a See Table 4-2 for current performance sources and definition of terms.

be translated into specific, validated measures with associated data that can be applied at different levels for different groups, from the national or state level to the level of a single community or organization. Although the Committee recognizes the limitations of the data currently available for gauging multilevel performance on the issues addressed by the core measure set, it

believes that a reliable measure—single or composite—can be developed for each core measure focus identified. Further, including the measures in the core set can create the impetus to develop the data needed to calculate them.

In the face of current limitations, and until specific measures can be further tested and made available at multiple levels or new measures and composites are developed that better capture the full intent of the measure foci, the Committee has identified best current measures that provide a near-term reflection of the target issues and their associated outcomes and can be used to help operationalize the measure set now. For example, the core measure focus for appropriate treatment is evidence-based care. Because a high-quality composite measure for this indicator is not yet available, the Committee selected the preventable hospitalization rate as a best current measure. Although this measure has a number of limitations, including that it focuses exclusively on hospital care and is not pegged to specific guidelines or associated evidence, it does provide useful information about the health care system's ability to provide appropriate treatment and evidence-based care. To illustrate how the core measures will be operationalized, the Committee developed an example set of national performance numbers for each of the best current measures. These figures for current national performance are presented for illustrative purposes and do not represent the Committee's endorsement of the detailed measure specifications behind each number. While they may be imperfect in fully capturing the core measure foci, they are measures for which reliable data are available at the national level. (See Table 4-2 for national performance measures source material and definitions.)

Another important consideration was the selection of appropriate benchmarks for performance, although the identification of specific benchmarks or goals for the core measures was beyond the scope of the Committee's charge. A key question here was whether there should be fixed benchmarks for national performance or benchmarks should be identified relative to an individual's, organization's, or community's past performance. Fixed benchmarks would allow for direct comparisons of relative performance among groups, while relative benchmarks would incentivize improvement for all participants and would be less dependent on individual circumstances, variations in population characteristics, or geography. Relative benchmarks also could be helpful for individuals and organizations seeking to assess the success of their improvement efforts over time.

Overall, in selecting best current measures for the core measure foci, the Committee gave priority to those for which data are commonly used, available, and understood, and it attempted to adhere as closely as possible to the intent of each core measure and to ensure that the current measures selected would be readily understandable to a broad audience.

TABLE 4-2 Current National Performance on Best Current Measures, with Provisional Local and Institutional Sources

Best Current Measure	National Performance ^a	Source	Year ^b	Local Source (provisional)	HCO Source (provisional) ^c
Life expectancy at birth	79-year life expectancy at birth	CDC VSS ^d	2014	VSS state data	Local data
Self-reported health	66% report being healthy ^e	CDC NHIS ^f	2013	CHR, ^g BRFSS	Patient query
Body mass index (BMI)	69% of adults with BMI of 2.5 or greater ^b	CDC NHANES ⁱ	2013	CHR, NCCDPHP	Clinical records
Addiction death rate	200 addiction deaths per 100,000 people aged 15+ ^j	SG and VSS ^k	2014	VSS state data	Clinical records
Teen pregnancy rate	27 per 1,000 females aged 15 to 19 ^l	CDC VSS	2014	CHR, NCHS	Local birth data
High school graduation rate	80% graduate in 4 years ^m	DOEd NCES ⁿ	2014	CHR, NCES	Local data
Childhood immunization rate	68% of children vaccinated by age 3 ^o	CDC NIS ^p	2012	Local PH	Clinical records
Unmet care need reported	5% report unmet medical needs ^q	CDC NHIS	2014	State estimates	State estimates
Hospital-acquired infection (HAI)	1,700 HAIs per 100,000 hospital admissions ^r	CDC HAI and AHRQ HCUP ^s	2014	CDC state data	Clinical records
Preventable hospitalization rate	10,000 avoidable per 100,000 hospital admissions ^t	AHRQ HCUP	2013	CHR; HCUP	Clinical records
Patient-clinician communication	92% report satisfaction ^u	CAHPS ^v	2013	Plans, providers	Patient query

High spending relative to income	46% spent >10% of income on health or were uninsured in 2012 ^w	CF ^x	2012	CF state data	Patient query
Per capita expenditures on health care	\$9,000 per capita ^y	CMS ^z	2013	State spending	TCOC & RU ^{aa}
Health literacy rate	12% with proficient health literacy ^{bb}	DOEd NCES	2006	(not available)	(not available)
Social support	21% inadequate social support ^{cc}	CDC BRFSS	2014	CHR, BRFSS	Patient query

^a Rounded to nearest integer or nearest 1,000.

^b Year refers to year published.

^c HCO = health care organization.

^d CDC VSS = Centers for Disease Control and Prevention Vital Statistics System.

^e Percent who report excellent or very good health.

^f NHIS = National Health Interview Survey.

^g CHR = County Health Rankings.

^h Overweight defined as having a BMI of 25 or greater. Refers to BMI for adults 20 and older.

ⁱ NHANES = National Health and Nutrition Examination Survey.

^j Computed. 2014 *Surgeon General's Report: The Health Consequences of Smoking—50 Years of Progress* estimates 480,320 deaths among people 35 and older are attributable to smoking annually, 2005–2009. Add 39,030 drug-induced deaths among people 15 and older in 2009 and 24,515 alcohol-induced deaths among people 15 and older in 2009 (CDC Deaths: Final Data 2009). Summing these figures produced a total of 543,865 addiction-induced deaths in 2009 among people 15 and older. Given that there were 240,144,000 people 15 and older in 2009, this produced a rate of 226.5 addiction-induced deaths per 100,000 people 15 and older, which was rounded to 200 addiction deaths per 100,000 people 15 and older.

^k SG = 2014 *Surgeon General's Report: The Health Consequences of Smoking—50 Years of Progress*.

^l Computed. In 2013, 274,641 babies were born to women 15–19 years old. This gives a live birth rate of 26.6 per 1,000, which was rounded to 27 per 1,000.

^m Refers to public high school graduation rate.

ⁿ DOEd NCES = Department of Education National Center for Education Statistics.

^o Refers to vaccination rate for children 19–35 months of age who receive combined series of recommended vaccines. Includes ≥4 doses of DTaP, ≥3 doses of poliovirus vaccine, ≥1 dose of measles vaccine, full series of Hib (3 or 4 doses, depending on product), ≥3 doses of HepB, ≥1 dose of varicella vaccine, and ≥4 doses of PCV.

^p NIS = National Immunization Survey.

^q Refers to the percent of people who failed to obtain needed medical care because of cost at some time during the past 12 months.

^r Computed. Refers to patients in acute care hospitals with at least one health care-associated infection (<http://www.nejm.org/doi/full/10.1056/NEJMoa1306801#?articleTop>). This total of 648,000 patients with HAIs was converted to a per 100,000 rate using data from the National Inpatient Survey (NIS), which estimates 39 million hospital stays in 2010. This yielded 1,662 HAIs per 100,000.

continued

TABLE 4-2 Continued

^s CDC HAI = CDC Healthcare Associated Infection Prevalence Report; HCUP = Agency for Healthcare Research and Quality (AHRQ) Healthcare Cost and Utilization Project.
^t Computed. HCUP reports 3.9 million preventable hospitalizations per year. This was converted to a per 100,000 rate using the HCUP 2010 National Inpatient Survey, which reports 39 million hospital stays per year. This yields a rate of 10,000 per 100,000.
^u Refers to the percent of people reporting the highest level of satisfaction with their provider's communication.
^v Top box scores from Consumer Assessment of Healthcare Providers and Systems (CAHPS) Clinician and Group Survey 2013.
^w Refers to percent of adults who were uninsured or underinsured in 2012. Underinsured is defined as insured all year but experiencing either out-of-pocket expenses that were 10% or more of income; out-of-pocket expenses equaling 5% or more of income (less than 200% of poverty level); or deductibles equaling 5% or more of income.
^x CF = The Commonwealth Fund.
^y Refers to national health expenditures per person in 2013.
^z CMS = Centers for Medicare & Medicaid Services.
^{aa} TCOC & RU: total cost of care and resource use.
^{bb} Proficiency represents the highest level of literacy on the following scale: below basic, basic, intermediate, proficient.
^{cc} Behavioral Risk Factor Surveillance System (BRFSS) data as reported by the County Health Rankings for 2005-2011. Refers to inadequate social and family support.

The Committee anticipates the development of better measures over time, along with progress in the capacity for their use and impact.











THE CORE MEASURE SET

If, on the one hand, single measures such as life expectancy and self-reported health status are too narrow to serve as a proxy for American health, and health care, and, on the other hand, there exist too many overlapping and uncoordinated measures to enable a ready assessment of the state of America's health and health care, how can the right number of measures be identified? Because there is no definitive answer to that question, the Committee approached the issue by using a framework with the four domains in its charge—healthy people, quality of care, costs of care, and people's engagement in health and health care—as a starting point. Within each domain, the Committee then pursued a consensus-based, iterative process for identifying the critical facets or “key elements” of each domain. Within each key element, the Committee then identified major foci for measurement and assessment, or “core measures.” A single core measure was identified for each key element. The exception to this pattern was healthy behaviors, for which, because of their distinctiveness and importance, the Committee identified three core measures. As discussed above, to facilitate near-term applicability, the Committee also identified a best current measure for each of the 15 core measures. These indicators represent how each core measure can, or could, be operationalized to provide practical information about the state of American health and health care.

Finally, the Committee identified an additional 39 “related priority measures” that, together with the core measures, give a more detailed view of the state of the nation's health and health care and enhance the flexibility of core measures for application in diverse health stakeholder groups. While improving health is a shared goal across the health system, stakeholder groups have different foci for action and, therefore, may have priorities for measurement in certain areas.




These related priority measures, shown in Table 4-3, are sufficiently granular and specific to be actionable by stakeholders as needed for their particular circumstances. The Committee anticipates that these related measures would provide texture for those working with a particular emphasis in health and health care. For example, related priority measures could provide more actionable information for providers working in certain specialties, or for community activists who are focused on particular community health outcomes or issues. Given the broad nature of the core measure set, the related priority measures can increase the actionability of the set by providing a tool for different stakeholder groups to focus attention on particular areas.

TABLE 4-2 Core Measure Set with Related Priority Measures

Core Measure Focus	Best Current Measures	Related Priority Measures
 Life expectancy	Life expectancy at birth	Infant mortality Maternal mortality Violence and injury mortality
 Well-being	Self-reported health	Multiple chronic conditions Depression
 Overweight and obesity	Body mass index	Activity levels Healthy eating patterns
 Addictive behavior	Addiction death rate	Tobacco use Drug dependence/illicit use Alcohol dependence/misuse
 Unintended pregnancy	Teen pregnancy rate	Contraceptive use
 Healthy communities	High school graduation rate	Childhood poverty rate Childhood asthma Air quality index Drinking water quality index
 Preventive services	Childhood immunization rate	Influenza immunizations Colorectal cancer screening Breast cancer screening
 Care access	Unmet care need	Usual source of care Delay of needed care
 Patient safety	Hospital-acquired infection rate	Wrong-site surgery Pressure ulcers Medication reconciliation
 Evidence-based care	Preventable hospitalization rate	Cardiovascular risk reduction Hypertension control Diabetes control composite Heart attack therapy protocol Stroke therapy protocol Unnecessary care composite
 Care match with patient goals	Patient–clinician communication satisfaction	Patient experience Shared decision making End-of-life/advanced care planning
 Individual spending burden	High spending relative to income	Health care–related bankruptcies

continued

TABLE 4-2 Continued

Core Measure Focus	Best Current Measures	Related Priority Measures
 Population spending burden	Per capita expenditures on health care	Total cost of care Health care spending growth
 Individual engagement	Health literacy rate	Involvement in health initiatives
 Community engagement	Social support	Availability of healthy food Walkability Community health benefit agenda

The Committee believes that the core measure set presented in Table 4-1 constitutes a set of the vital signs for assessing the state of the nation's health and health care and progress in their improvement over time. The text that follows describes each core measure in turn—its importance, the best current measure for its focus, the related priority measures, and the disparities among population subgroups in that focus area.



Life Expectancy

Importance

Life expectancy is a validated, readily available, and easily comprehensible indicator for a critical health concept—length of life—based on the simple logic that healthier people tend to live longer. Because life expectancy depends on a full range of individual and community influences on health—from cancer to homicide—it provides an inclusive, high-level indicator for health, broadly defined. Life expectancy also is useful comparatively across institutions, communities, states, regions, and nations as a means of quickly assessing relative health. Given its broad scope, moreover, life expectancy has significant potential to drive coordinated action toward health improvement. A reversal in life expectancy for a group, or an intractable or increasing disparity, is a fundamental and strong failure alert. Improving life expectancy for any group requires the engagement of a broad range of stakeholders working individually and in coordination to address the causes of premature death in the population as whole, as well as in key demographic subpopulations. For example, safer cars and roads

could reduce traffic fatalities; more effective community policing could reduce violent crime; increased investment in biomedical research could result in new therapies and interventions; and improved health literacy could lead to more people taking an active role in maintaining and improving their behavioral health. Thus, life expectancy is a sentinel and cross-cutting core measure for which a broad range of stakeholders are accountable.

Best Current Measure

The Committee identified life expectancy at birth, as reported by the Centers for Disease Control and Prevention's (CDC's) Vital Statistics System, as the best current measure for life expectancy (CDC, 2015b). This measure encompasses deaths at all ages and from all causes and is a simple, reliable, accessible, and routinely utilized barometer for the overall health of a population. Data for this measure have been collected by the U.S. government for more than 100 years (Glover, 1921). The CDC reports life expectancy estimates annually, including estimates for different demographic groups. The data used to create these life expectancy estimates are collected and reported at the county level, such that data in the CDC Vital Statistics System can be used for more granular estimates of county, state, and regional life expectancy. Life expectancy also is an important indicator of the relative performance of the United States among peer countries. While the average life expectancy at birth for the OECD countries was 80.1 years in 2011, American life expectancy was 78.7 years (see Figure 4-1), 4.1 years less than citizens could expect to live in Switzerland, the leader in life expectancy (OECD, 2013).

It should be noted that life expectancy at birth has limitations as a best current measure for life expectancy, including issues of representativeness. For example, life expectancy alone provides little information on specific causes of or potential solutions for health challenges; more specific measures of mortality for specific causes or groups can be useful in developing interventions or solutions aimed at improving life expectancy. The usefulness of life expectancy may also be limited for small groups or groups including only young people in whom the number of deaths is low. Additionally, because life expectancy includes infant mortality, these deaths may have a large effect on the average.

While significant additional measure development is needed for the majority of the core measures, life expectancy at birth is an example of a best current measure that is sufficiently valid and reliable to represent the core measure concept. However, additional development in the measurement of life expectancy may produce more innovative approaches to both measuring and presenting information about length of life.

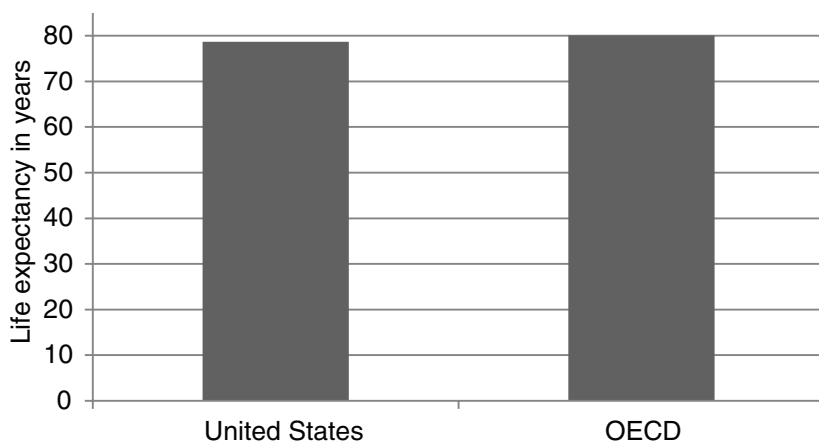


FIGURE 4-1 Life expectancy at birth: United States versus OECD countries.
SOURCE: OECD, 2013.

Related Priority Measures

Alternative measures considered by the Committee include life expectancy at various ages, infant mortality, maternal mortality, quality-adjusted life years (QALYs), health-adjusted life years (HALYs), and mortality due to violence and injury. Each of these measures provides important information about a key factor in the population's health. These measures generally are more granular than life expectancy at birth, and they provide additional information about significant causes of shorter life expectancies in the United States. Among them, the Committee selected three related priority measures for the life expectancy core measure: infant mortality, maternal mortality, and mortality due to violence and injury. Each of the issues addressed by these measures is important to improving life expectancy in the United States, and each may be useful for stakeholder groups focused on particular aspects of length of life. For example, a community organization with a particular focus on preventing violence would use mortality due to violence and injury to provide additional insights to serve its particular mission.

Disparities

Life expectancy reveals disparities in overall health outcomes for demographic and socioeconomic groups, as well as for geographic regions. While life expectancy for the white population is 78.9 years, it is 75.1 years for the black population and 81.2 years for the Hispanic population (Murphy et al., 2013) (see Figure 4-2). In Mississippi, life expectancy among African

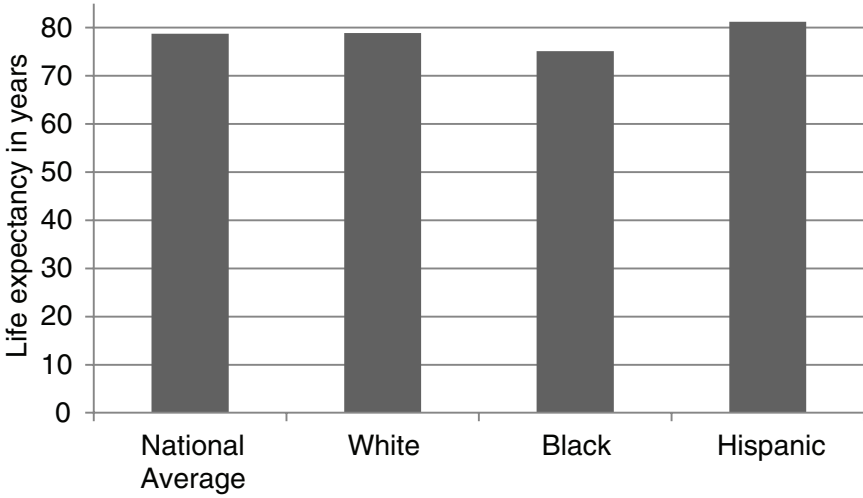


FIGURE 4-2 Disparities in U.S. life expectancy at birth.
SOURCES: Murphy et al., 2013; OECD, 2013.

Americans is 72.4 years, while white residents of that state live 76.1 years (CDC Vital Statistics Cooperative Program, 2010). Moreover, life expectancy for women generally is longer than for men—81.0 years versus 76.2 years (Murphy et al., 2013).



Well-being

Importance

Life expectancy and death rates from various diseases and injuries provide clear measures of health in a population group, but health and well-being in the population have many other components, including illness from chronic or acute diseases, injury, functional capacity, mental health, sense of security, and social networks. As the World Health Organization notes, “Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (WHO, 1946). The health of an individual has both objective and subjective dimensions. In fact, people’s perception of their own health not only is an indication of well-being but is often a predictor of utilization of and satisfaction with health care.

An estimated 84 percent of health care spending in the United States is attributable to chronic diseases, which affect approximately half of the adult population (RWJF, 2010). Closely linked to many of these chronic diseases are a variety of health risk behaviors. For example, approximately half of adults do not get sufficient aerobic exercise, and approximately three-quarters of adults fall short of recommendations for regular muscle-strengthening physical activity (CDC, 2012c). And approximately 23 percent of adults report eating vegetables less than once per day (CDC, 2013c). Chronic diseases are associated with significant disabilities, which negatively impact well-being and life expectancy, among other health factors. For example, approximately half of adults with disabilities report no physical activity, and they are more likely to have one or more chronic diseases relative to adults with disabilities who do report physical activity (Carroll et al., 2014).

Well-being is a measure with the capacity to drive action among a broad range of stakeholder groups, as it encompasses a large number of potential causal factors, from poverty to depression to chronic disease. Improving well-being across the nation will require collective action, extending well beyond the care system to include such groups as employers, schools, community organizations, and others.

Best Current Measure

The Committee identified self-reported health status as the best current measure for well-being. It is a uniquely broad and accessible measure that encompasses such factors as mental health, disability, and reproductive health, among others, in a simple manner that needs no explanation. The use of self-reported health status as a measure of health emerged in the early 1980s, prompted by the publication of the Manitoba Longitudinal Study, which found that self-reported health status was a stronger predictor of health outcomes than medical records or self-reports of medical conditions (Mossey and Shapiro, 1982). Self-reported health status has been shown to be an independent predictor of life expectancy and a reliable measure for health and wellness in the United States (Idler and Benyamini, 1997). People who self-report that their health is poor have a mortality risk twice as high as that of people who report excellent health (DeSalvo et al., 2006). Self-reported health also has been shown to be a useful predictor for expenditures (DeSalvo et al., 2009).

Data on self-reported health status are collected annually through the CDC's National Health Interview Survey (NHIS). In 2014, 66.2 percent of people reported that they were in excellent or very good health (Ward et al., 2014). The NHIS also provides estimates of self-reported health status for subpopulations, including by gender, race, and ethnicity. Data on

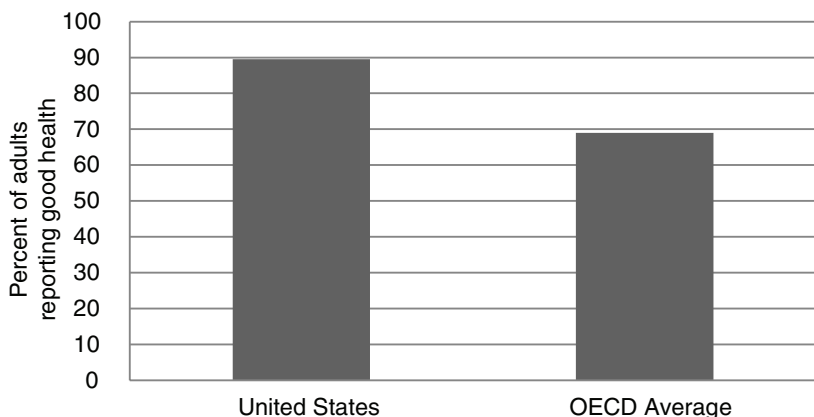


FIGURE 4-3 Adults self-reporting good health: United States versus OECD countries.
SOURCE: OECD, 2013.

self-reported health status also are available at more granular geographic levels from various other sources. Figure 4-3 shows a comparison of the percentage of adults reporting good health in the United States and the OECD countries.

A potential limitation of self-reported health status is that it may reflect cultural factors not directly dependent on health, such that some subpopulations may score systematically lower because of differing cultural concepts and definitions of what it means to be healthy (Shetterly et al., 1996). This limitation may also affect comparability on an international scale, although self-reported health is used as a health indicator by the World Health Organization and the OECD.

While self-reported health status is a powerful tool for assessing well-being in terms of both its statistical validity and its conceptual simplicity, additional measure development may lead to improvements. For example, some survey structures may be superior to others for assessing well-being, so that improvements in the structure and wording of survey questions could lead to more accurate measures. There may also be novel solutions to incorporating self-reported health into electronic health records, such that data could be gathered and aggregated from the individual level rather than through a traditional survey mechanism.

Related Priority Measures

Alternative measures considered by the Committee include functional status, healthy days, QALYs or HALYs, mental health, and reproductive health. While each of these measures provides valuable information about aspects of well-being, many of these other measures provide additional, more detailed information about different aspects of well-being. Among them, the Committee selected two related priority measures for well-being: multiple chronic conditions and depression. These two measures provide information about well-being from two critical perspectives for the nation's health: chronic disease and mental health. An estimated 117 million Americans, or half of the U.S. population, have at least one chronic disease, and these conditions account for an estimated 86 percent of health care dollars (CDC, 2015a; Ward and Schiller, 2013). An estimated 25 percent of Americans have a mental illness, and the economic burden of mental illness was estimated at \$300 billion in 2002 (Reeves et al., 2011).

Disparities

Self-reported health status shows disparities across certain demographic groups (see Figure 4-4). For example, 70.5 percent of non-Hispanic whites report excellent or very good health, compared with 58 percent for Hispanics, 60.1 percent for non-Hispanic blacks, and 66 percent for the population at large (CDC, 2013a). Data also suggest that men are more likely than women to report having excellent health, while women are more likely than men to report that their health is fair (CDC, 2013a). Moreover, the percentage of people reporting excellent or very good health tends to decrease with

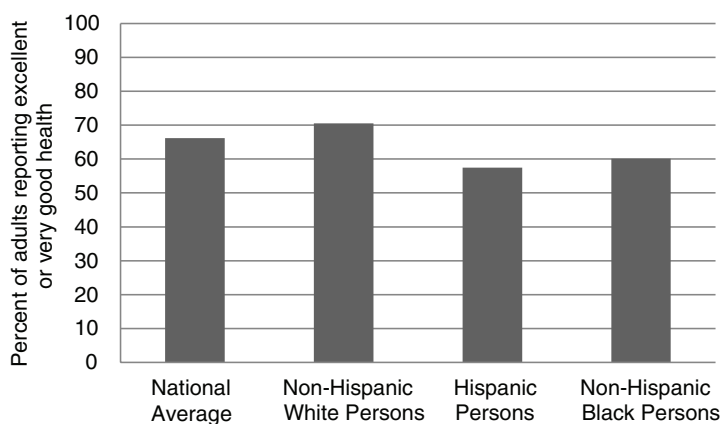


FIGURE 4-4 Disparities in U.S. self-reported health status.
SOURCE: CDC, 2013a.

age, from 84 percent for people under age 18, to 64 percent for those aged 18-64, to 45 percent for those aged 65 and older (CDC, 2013a).



Overweight and Obesity

Importance

An estimated 35 percent of U.S. adults and 17 percent of U.S. children and adolescents are obese (Ogden et al., 2014). Obesity accounts for an estimated \$147 billion annually in medical costs, and people who are obese have annual individual medical costs estimated to be \$1,429 higher than those of people who are not obese (Finkelstein et al., 2009). The increasing rates of overweight and obesity among U.S. adults and children are associated with numerous health conditions, including hypertension, coronary heart disease, type 2 diabetes, and stroke. Figure 4-5 shows a comparison of the prevalence of obesity in the United States and the OECD countries.

Overweight and obesity presents a significant challenge for American health. It is a feature of American life with causes and consequences that extend beyond the scope of the health system, including socioeconomic, cultural, and lifestyle factors, in particular diet and physical activity, which together constitute leading causes of early death. Therefore, reducing the prevalence of overweight and obesity in the United States—and, by

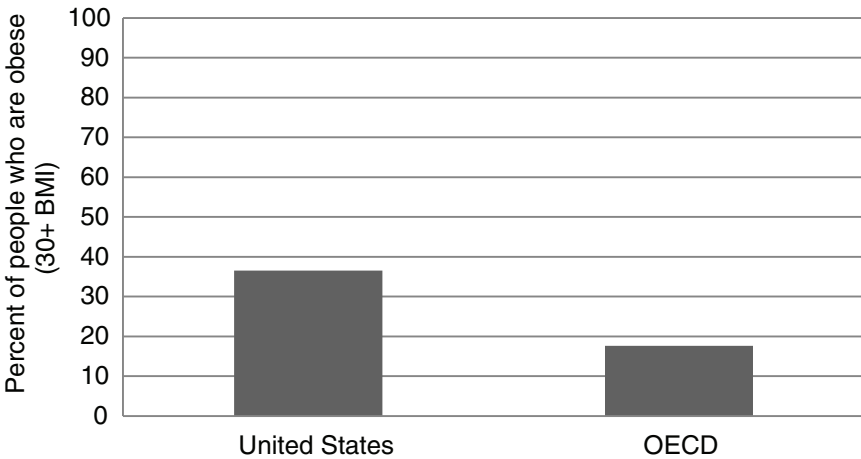


FIGURE 4-5 Obesity prevalence: United States versus OECD countries.

NOTE: BMI = body mass index.

SOURCE: OECD, 2013.

extension, improving health and reducing care costs across the nation—will depend on the coordinated efforts of many stakeholder groups.

Best Current Measure

Body mass index (BMI), a relative number derived from an individual's weight and height, serves as a reliable indicator of overweight and obesity. The Committee therefore identified BMI as the best current measure for this core measure focus.

Data on BMI are collected annually by the CDC through the National Health and Nutrition Examination Survey (NHANES), and they are also available through a variety of other sources and at various levels. In 2012, an estimated 69 percent of U.S. adults were overweight or obese, which is defined as having a BMI of 25 or greater (CDC, 2013b). The CDC NHANES data provide estimates for different subpopulations by age, gender, and race and ethnicity. Calculating this weight/height ratio is easy and inexpensive in both the care and the home settings, allowing for quick comparisons of weight status among individuals, groups, and the public. The BMI scale marks the relationship between weight and obesity-related disease and death.

Because of the ease of measurement and high standardization, BMI is the most common method for assessing obesity and screening for associated health risks. The CDC uses BMI as its primary measure to determine overweight and obesity among the general population. BMI calculation, used primarily as a screening tool, can be followed by more detailed diagnostic tests to fully assess health risk. BMI can be calculated personally with the aid of online BMI charts, and because of its ease of applicability it can be a tool for motivating change.

While the BMI ratio does not measure body fat directly, research has shown that it is strongly correlated with more direct measures of body fat (Mei et al., 2002). Although the correlation between BMI and body fat percentage is strong, this correlation differs, however, according to gender, age, and race, largely because BMI does not distinguish between body fat and lean body mass. At a constant BMI ratio, for example, women are likely to have more body fat than men, and older adults are likely to have more body fat than younger adults. In addition, research has indicated differences in health risks across ethnicities at the same BMI. Studies have found that blacks have a leaner muscle mass and thus lower body fat than whites, suggesting that blacks are at a lower risk of obesity-related health issues than whites with the same BMI ratio (Rush et al., 2007). However, the incidence of obesity is higher in non-Hispanic blacks in the United States than in non-Hispanic whites, so overall, the former are still more susceptible to obesity-related health issues than the latter (Flegal et al., 2012).

Better measures for overweight and obesity may be developed in the future. For example, while BMI data are relatively easy to collect and calculate based on weight and height, more precise measurements based on percent body fat or other features may become feasible with improvements in data and measurement.

Related Priority Measures

Alternative measures considered by the Committee include caloric intake, fruit and vegetable consumption, sedentary lifestyles, and activity levels. Each of these measures provides important information about a key component of overweight and obesity. Among them, the Committee selected two related priority measures for overweight and obesity that provide a more granular view of two major elements of excess body fat: excessive caloric input and insufficient caloric output. Activity levels and healthy eating patterns focus on these two critical factors in overweight and obesity, and they are closely linked to the shifts in behavior that matter most for reducing overweight and obesity nationwide.

Disparities

The BMI ratio underscores disparities in health outcomes for racial and socioeconomic groups, as well as a regional divide in overweight and obesity statistics across the nation. For instance, 83 percent of males of Mexican origin are overweight or obese, while 69 percent of adults aged 20 and over are classified as overweight or obese in the general U.S. population (NCHS, 2014). From 2009 to 2012, 36 percent of the general U.S. population was obese or had a BMI greater than or equal to 30. Obesity was slightly more common among women, at 36 percent, than among men, at 35 percent. Black men and women had obesity rates of 39 and 58 percent, respectively. Among people of Mexican origin, 41 percent of males and 48 percent of females were obese (NCHS, 2014) (see Figure 4-6).



Addictive Behavior

Importance

Addiction and addictive behavior represent a significant and complex challenge for the health system, as well as for communities and families. Approximately 19 percent of American adults smoke, 17 percent of adults

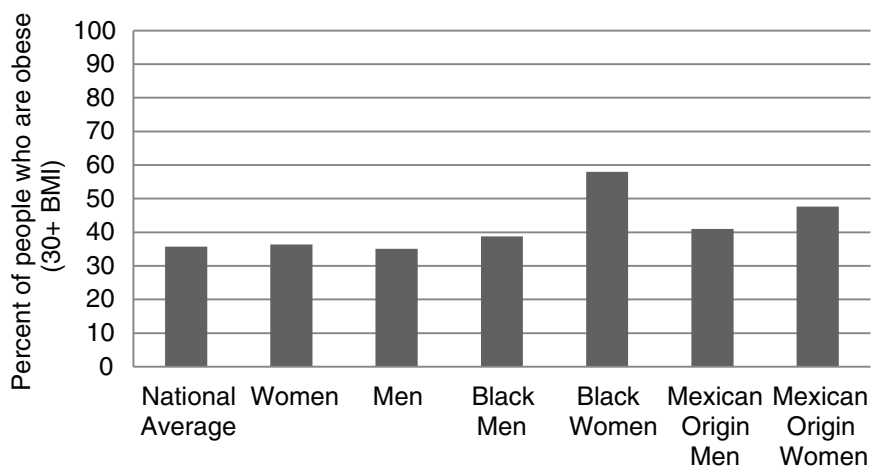


FIGURE 4-6 Disparities in obesity prevalence.

NOTE: BMI = body mass index.

SOURCE: NCHS, 2014.

binge drink, and an estimated 9 percent of people aged 12 years and older were found to have used an illicit drug within the past month (CDC, 2011, 2012b; NCHS, 2014). Increasingly, misuse of prescription drugs contributes to premature death. The estimated economic cost of substance abuse and addiction in the United States is \$559 billion per year (NIDA, 2008).

Smoking persists as a significant cause of poor health despite decades of scientific evidence for its contributions to morbidity and mortality, as well as governmental and public health efforts to counter both smoking behavior and its biological effects (HHS, 2014a). Figure 4-7 shows a comparison of the percentage of adults who smoke daily in the United States and the OECD countries. Today, tobacco use is considered the leading cause of preventable morbidity and mortality in the United States (CDC, 2011). The most recent estimate available from the CDC suggests that between 2005 and 2009, 480,320 deaths were attributable to smoking each year, including deaths from cancer, cardiovascular and metabolic diseases, respiratory conditions, perinatal conditions, and secondhand smoke (HHS, 2014a). It is estimated that smokers live an average of 11 to 12 fewer years than nonsmokers (HHS, 2014a).

Addiction and misuse of alcohol and drugs also present a central challenge for the health and health care of Americans. And the broad family and social impacts of addiction to alcohol and other drugs may well exceed the consequential impacts of tobacco use.

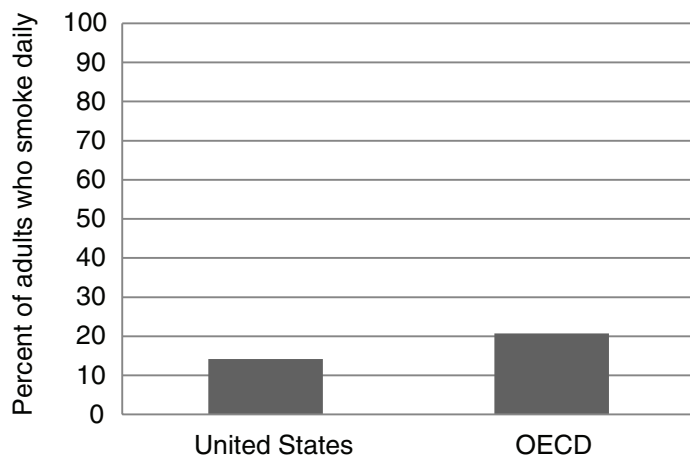


FIGURE 4-7 Smoking behavior. Percentage of adults who smoke daily: United States versus OECD average.

SOURCE: OECD, 2013.

All addictions are shaped by a range of biological, social, and cultural factors, and progress in preventing, mitigating, and managing the health impacts of addiction depends on the coordinated actions of multiple stakeholders beyond health care, including policy makers, scientific researchers, schools, law enforcement, families, and other community stakeholders. The success of counteradvertising, taxation, and labeling in reducing tobacco use stands as an important testament to this fact, as do other successes related to alcohol and drug use (Hammond et al., 2003).

Best Current Measure

The Committee identified the addiction death rate as the best current measure for addictive behavior. Data on mortality due to addictive behavior come from a variety of sources, including the CDC Vital Statistics System, which reports data on the numbers and rates of death associated with individual *International Classification of Diseases* (ICD)-10 codes. Summing the CDC estimates for contributions from tobacco, alcohol, and drugs, the Committee computed an approximate best estimate of 200 addiction-related deaths per 100,000 people aged 15 and older (see Table 4-2). It should be emphasized both that this is a rough approximation, derived from different sources, and that the methodology will need substantial work if it is to be available on an annual basis and computable at multiple levels.

Related Priority Measures

Alternative measures considered by the Committee include rates of smoking, excessive alcohol use, and illicit drug use. While deaths due to addictive behavior provide an aggregate view of U.S. mortality across these three addiction categories, the Committee selected three related priority measures that reflect these categories for use by stakeholder groups that may need a more detailed view of the behaviors associated with addiction-related mortality: tobacco use, drug use, and excessive drinking. For example, some communities may have smoking rates that are lower than average but a significantly higher incidence of drug use. For such communities, the use of a measure of drug use can provide more actionable information than the aggregate current best measure.

Disparities

Data on addiction-related mortality highlight significant disparities in health and mortality across groups defined by geography, race/ethnicity, gender, and socioeconomic status (see Figure 4-8). For example, it is estimated that 138 deaths per 100,000 population are attributable to smoking in Utah, while the estimated rate in Kentucky is 371 per 100,000. In terms of gender, the CDC estimates that 16 percent of women are current smokers, compared with 21 percent of men. Among racial/ethnic groups, smoking rates are lowest among Asian adults (10 percent), and are higher for American Indian or Alaska Native adults (19 percent), white adults (19 percent), and black adults (17 percent). Additionally, the percentage of current smokers under age 65 is twice as high within both the uninsured

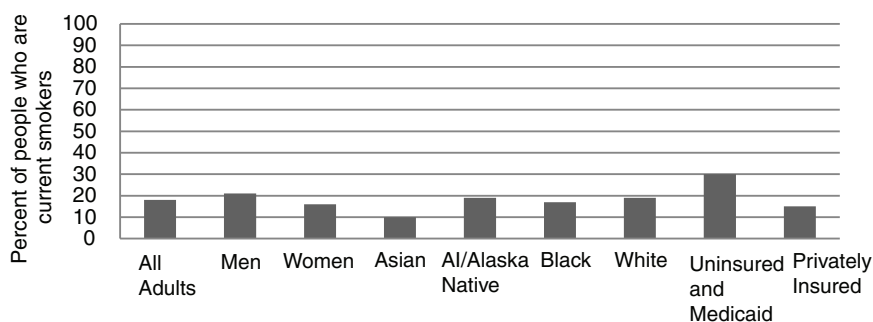


FIGURE 4-8 Current smokers by demographic group.

NOTE: AI = American Indian.

SOURCE: Blackwell et al., 2014.

and Medicaid populations (30 percent) relative to the privately insured population (15 percent) (Blackwell et al., 2014).



Unintended Pregnancy

Importance

Unintended pregnancy presents a significant challenge for both individual and community health. According to a report from the CDC's Division of Vital Statistics, it is the most direct available measure of women's ability to choose the number and timing of their pregnancies. As such, it is a measure that aggregates a variety of social, behavioral, cultural, and health factors, particularly the availability and use of both knowledge and tools for family planning.

In 2010, an estimated 37 percent of births in the United States were unintended at the time of conception—a figure that had not declined significantly since 1982 (Mosher et al., 2012). The literature on unintended pregnancy shows that infants and children whose births were unintended by the mother have a variety of elevated risks, including adverse social, economic, and health outcomes. Factors implicated in these increased risks include delayed prenatal care, smoking during pregnancy, not breastfeeding the baby, poorer childhood health, and poorer outcomes for both the mother and the mother–child relationship (Mosher et al., 2012). The results of longitudinal studies following the children of unintended pregnancies into adulthood also have found poor long-term social and health outcomes (David, 2006). Making national progress in reducing unintended pregnancy will depend on a network of stakeholders at different levels, as the drivers and consequences of unintended pregnancy reach across the boundaries of the care system to include cultural factors and institutions, education, care access, and healthy behaviors.

Best Current Measure

The Committee identified teen pregnancy rate as the best current measure for unintended pregnancy. The number of live births to women aged 15 to 19 is readily countable, and it presents an accessible view of the extent to which births in the United States are planned and, by extension, the variety of social, cultural, educational, and health care factors related to the behaviors associated with unintended pregnancy. The data come from the CDC's Vital Statistics System, which reports birth data annually. In 2012, the live

birth rate for women aged 15-19 was 26.6 per 1,000, or a total of 274,641 babies born to women in this age group (see Figure 4-9) (Hamilton et al., 2013). The rate of teen pregnancy has been declining over the last decade, with 2012 representing a record low. The cause of this decline is unknown, but it may be related to lower levels of sexual activity in this age group, as well as greater use of birth control. Teen pregnancy was estimated to cost U.S. taxpayers \$9.4 billion in 2010 as a result of elevated health care and foster care costs, as well as increased incarceration rates and lower income among the children of teen mothers (The National Campaign to Prevent Teen and Unplanned Pregnancy, 2013). This last deficit is related to high school dropout rates for teen mothers. The children of teen mothers also experience poorer health outcomes relative to the children of older mothers.

While teen pregnancy offers a look at unintended pregnancy in the population of women aged 15 to 19, better measures are needed to provide a full assessment of unintended pregnancy across age groups. For example, the CDC's National Survey of Family Growth found that 23 percent of teen pregnancies were intended at conception, indicating that teen pregnancy is an imperfect proxy for unintended pregnancy (Mosher et al., 2012). Thus, as stronger measures are developed, teen pregnancy could be replaced by a more inclusive and precise measure of unintended pregnancy.

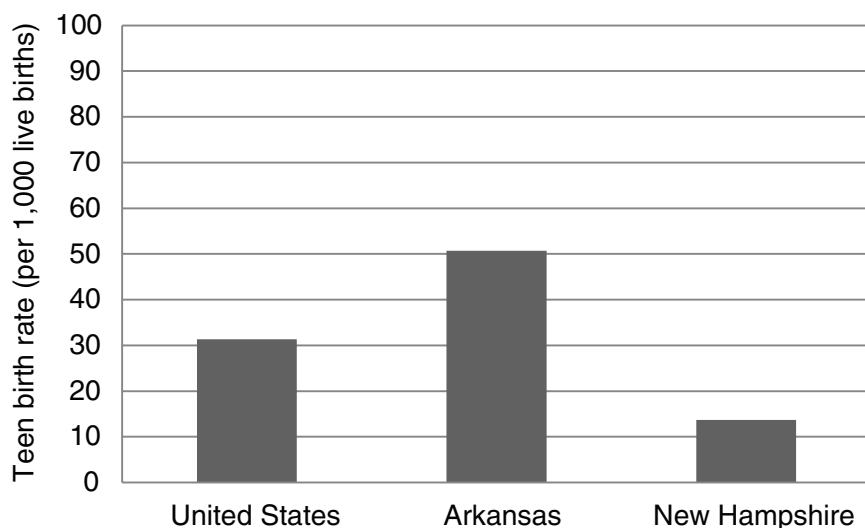


FIGURE 4-9 Teen pregnancy (aged 15-19 years): National average, worst-performing state, best-performing state.

SOURCE: Martin et al., 2013.

Related Priority Measures

Alternative measures considered by the Committee include family planning, contraceptive use, prenatal care, and low birth weight. Among these, the Committee selected contraceptive use as a related priority measure for unintended pregnancy. While teen pregnancy highlights a critical outcome related to contraceptive use, it also is more narrowly focused as it considers only women aged 15 to 19. The related priority measure of contraceptive use considers unintended pregnancy at any age, and could be useful for stakeholder groups that work with older populations or with a broader focus on women's health and health care.

Disparities

While teen pregnancy rates have declined over the past decade across all demographic groups, disparities persist in the rates for some racial and ethnic minorities. As illustrated in Figure 4-10, in 2013 the teen pregnancy rate was 39 per 1,000 live births for non-Hispanic blacks, 42 for Hispanics, 31 for American Indians/Alaska Natives, 19 for non-Hispanic whites, and 9 for Asians/Pacific Islanders (Hamilton et al., 2014).

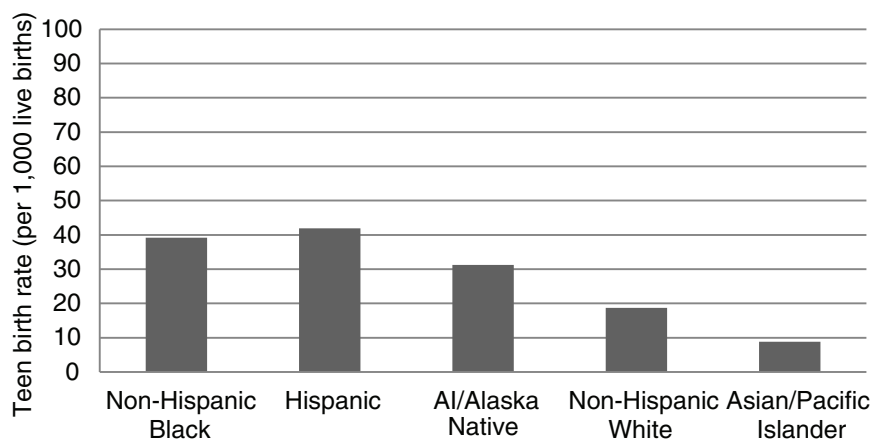


FIGURE 4-10 Teen pregnancy (aged 15-19) by race/ethnicity.

NOTE: AI = American Indian.

SOURCE: Hamilton et al., 2014.



Healthy Communities

Importance

Individual health is a function of a wide range of socioeconomic and community factors, ranging from environmental quality to infrastructure to social connections. Thus, our health is closely tied to our communities, and, just as individual actions to improve health can benefit the community, community actions to improve health can benefit each individual member. Community health encompasses critical elements of health that fall outside of the care system but have a major impact on care and health outcomes, such as education, employment, housing, and environment.

Best Current Measure

The Committee identified high school graduation rate as the best current measure for healthy communities. An estimated 80 percent of high school students graduate in 4 years (DOEd, 2014). Selecting a single indicator to represent the range of factors involved in community health presents a measurement challenge. The Committee discussed the possibility of a community needs composite measure or index that would combine the full range of socioeconomic, cultural, and community factors impacting health into a single, accessible measure. While a variety of promising measures of this sort exist, including the Rockefeller Institute's Economic Hardship Index or Dignity Health's Community Need Index, the Committee concluded that additional work would be needed to develop a reliable composite measure of community health. For the near term, the Committee suggests high school graduation rate as a best current measure for general community health. Education level is certainly one of the strongest predictors of health, associated with a range of improved health outcomes, including length and quality of life.

Among the elements typically measured to assess socioeconomic status—education, income, and occupation, or a composite thereof—education appears to be the strongest and most consistent socioeconomic status predictor of good health (Winkleby et al., 1992). While the effect of education on health is due in part to the education itself, educational attainment measures, such as high school graduation rate, also are correlated with poverty and socioeconomic status both before and after graduation. People who graduate from high school tend to have higher incomes than those who do not, and higher income can lead to improved access to care

as well as better quality of life. These effects can span generations, with children of educated parents being more likely to attain a quality education than children of parents with low educational attainment. While high school graduation rate falls short of encompassing the full range of community health factors, it is a useful, accessible proxy for assessing socioeconomic status and community quality in the short term.

Unemployment and poverty were also considered as potential candidates for the best current measure for community health, and the Committee believes that a composite measure for community health would likely include all of these elements. Although unemployment and poverty might provide more immediate measures of community health, and effects on education are likely to occur over a longer time period, the Committee considered it important to highlight education as a critical factor in community health and socioeconomic well-being and a major determinant of health. This was due in part to the conclusion that elements of socioeconomic status linked to income are demonstrated in other areas of the core measure set, particularly within “personal spending burden.” Findings in the literature suggest that the correlation between income and education is not strong enough to justify using one as a proxy for the other and that, in some cases, education may be the best single socioeconomic predictor of good health (Braveman et al., 2005; Winkleby et al., 1992). Further, high school graduation rate serves to highlight the important role of stakeholder groups not traditionally considered to be part of the health system.

Data on high school graduation rates are available from a variety of sources, including the National Center for Education Statistics, and have been collected annually by the federal government since 1870 (Snyder, 1993). Graduation rate data also are available at many levels—from individual schools to counties to states—and can be readily parsed by gender, race, and ethnicity.

Improving high school graduation rates and, by extension, the health of communities will require coordinated efforts from a broad range of stakeholder groups both within and outside of the health system. For example, one study found that a 10 percentage point increase in Medicaid eligibility among children resulted in a 5 percent decline in a state’s high school dropout rate (Cohodes et al., 2014). This finding suggests that increasing access to health care may enable more students to complete high school and, by extension, have higher incomes and make greater contributions to the economy throughout their lives.

While the Committee considers high school graduation rate to be the best current measure for community health, it could be replaced in the near term with a high-quality composite incorporating several of the most critical elements of community health. A preliminary composite measure for healthy communities might include education, air quality, walkability,

socioeconomic status, and access to healthy food. Developing composites for this and other measures where data currently are lacking is a priority for the implementation of core measures.

Related Priority Measures

Alternative measures considered by the Committee include environmental quality, poverty, quality of life, employment, and infrastructure. While many of these measures provide important information about a key aspect of community health, the Committee selected childhood poverty rate, childhood asthma, and air quality index as related priority measures. These three measures may be useful to certain stakeholder groups by illuminating additional facets of community health. For example, some communities may have particular challenges with air quality relative to other communities, such that assessing environmental health would increase the actionability of core measures for that community.

Disparities

As indicated by the high school graduation rate measure, 67 percent of American Indian/Alaska Native public high students graduate in 4 years, compared with 80 percent of public high school students across the country (DOEd, 2014). This statistical difference exemplifies the socioeconomic, racial, and regional disparities illuminated by the graduation rate measure (see Figure 4-11). During the 2011-2012 school year, 85 percent of female

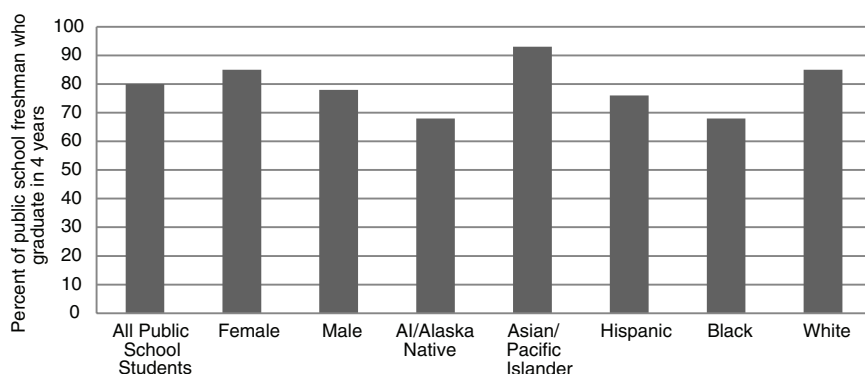


FIGURE 4-11 Disparities in percentage of public high school freshman who graduate in 4 years.

NOTE: AI = American Indian.

SOURCE: Stetser and Stillwell, 2014.

students graduated within 4 years, compared with 78 percent of male students. Graduation rates also varied by race and ethnicity, with data reported for the following groups: American Indian/Alaska Native (68 percent), Asian/Pacific Islander (93 percent), Hispanic (76 percent), black (68 percent), and white (85 percent) (Stetser and Stillwell, 2014).



Preventive Services

Importance

Appropriate use of clinical preventive services—immunization, counseling, and chemo prophylaxis—is important to improving health status and outcomes as well as efficiency in the delivery of care. The U.S. Preventive Services Task Force (USPSTF) recommends a range of services for different groups, from hearing loss screening for infants to tobacco cessation counseling for current smokers (USPSTF, 2010).

Spending on health care in the United States is focused disproportionately on treatment of disease. While more than 75 percent of U.S. health care expenditures is related to the treatment of preventable conditions, only an estimated 3 percent is devoted to prevention and public health improvement activities (IOM, 2012b). The 2012 Institute of Medicine (IOM) report *For the Public's Health: Investing in a Healthier Future* recommends that Congress double federal appropriations for public health in the interest of delivering a minimum package of public health services in every community nationwide (IOM, 2012b).

Increasing the coverage rate for preventive services is a goal that could bring together a broad range of stakeholder groups. While clinicians and public health stakeholders play a role in the direct provision of these services, education and outreach are critical to ensuring that people are both aware of the preventive services they need and readily able to access those services. The Patient Protection and Affordable Care Act (ACA) may have a significant impact on this core measure focus as it requires coverage without copays or deductibles for all USPSTF-recommended preventive services. Community actors such as employers, public schools, and religious organizations could play a critical role in connecting people with public health resources and eliminating the barriers that keep people from receiving recommended preventive services.

Best Current Measure

The Committee identified childhood immunization rate as the best current measure for preventive services. According to the CDC's National

Immunization Survey, 68.4 percent of children aged 19-35 months received the combined series of recommended vaccinations in 2012 (CDC, 2012a). (The combined series includes at least 4 doses of DTaP, at least 3 doses of poliovirus vaccine, at least 1 dose of measles vaccine, the full series of Hib [3 or 4 doses, depending on the product], at least 3 doses of HepB, at least 1 dose of varicella vaccine, and at least 4 doses of PCV.) The Committee discussed the need for a composite measure that would express the extent to which people receive recommended preventive services. However, there is currently no high-quality measure that meets the Committee's criteria. For the short term, the Committee proposes immunization status as a proxy for preventive services because it represents a particularly stable and long-lasting component of prevention and covers a broad non-disease-specific population. Immunizations have been shown to be among the most powerful preventive services in terms of their impact on both disease burden and costs. Data for this measure also are reliable. The CDC has collected data on immunization status annually since 1994 through the National Immunization Survey. These data provide estimates at the national and state levels and for selected urban areas (CDC, 2014d).

Whereas childhood immunization status provides a useful current window into preventive services by focusing on a single critical set of services, better measures may be developed in the future to assess the extent to which people receive the full range of recommended preventive services. Such a measure could take the form of a binary—the percentage of people receiving or not receiving recommended services—or an index, which would be used to assess the extent to which preventive services are received throughout the population. Developing composites for this and other measures where current data are lacking is a priority for the implementation of core metrics.

Related Priority Measures

Alternative measures considered by the Committee include the incidence of vaccine-preventable disease, colorectal cancer screening, aspirin for primary prevention of cardiovascular disease, breast cancer screening, tobacco cessation counseling, BMI screening and follow-up, and control of high blood pressure. While each of these measures provides important information about a key component of prevention, immunization status was selected as a proxy because it represents a particularly stable and long-lasting component of prevention and covers a large, non-disease-specific population. In addition to childhood immunization, the Committee identified three related priority measures for preventive services: influenza immunization, colorectal cancer screening, and breast cancer screening. While screening for many additional cancers are included in the USPSTF recommendations for preventive services, the Committee chose to highlight

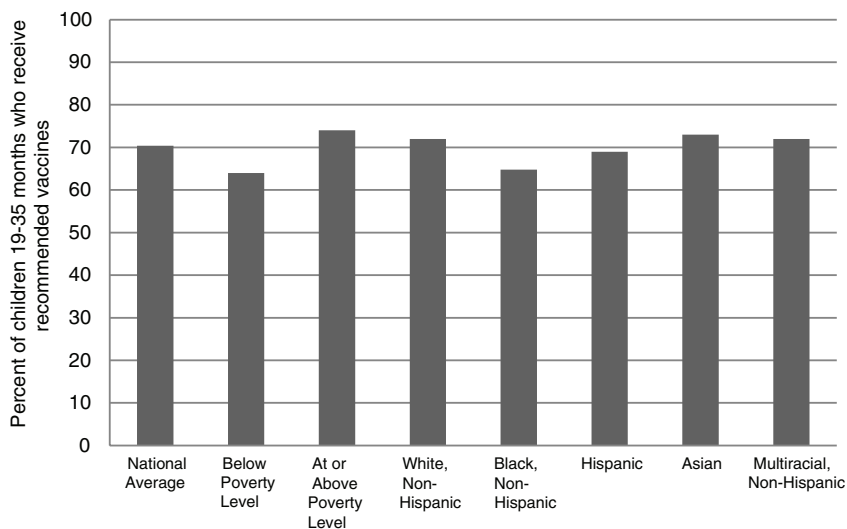


FIGURE 4-12 Disparities in percentage of children aged 19-35 months who received recommended vaccines, 2012.

SOURCE: CDC, 2012a.

colorectal and breast cancer because they are associated with the highest rates of mortality other than lung cancer, which is included as a component of the core measure for addictive behavior (American Cancer Society, 2014).

Disparities

The immunization status measure highlights disparities in health outcomes across demographic groups, particularly within socioeconomic subgroups (see Figure 4-12). In 2012, recommended vaccines were received by 64 percent of children aged 19-35 months living below the federal poverty level, compared with 70 percent of children of this age in the U.S. population at large (CDC, 2014d) and 74 percent of those at or above the poverty level (CDC, 2012a). Childhood vaccine coverage, as reported by the CDC, is estimated at 72 percent for non-Hispanic white children, 65 percent of non-Hispanic black children, 69 percent of Hispanic children, 73 percent of Asian children, and 72 percent of non-Hispanic multiracial children.



Care Access

Importance

The ability to receive care when needed is a critical precondition for effective system performance. Unmet need for health care may occur for a variety of reasons, including lack of or insufficient health insurance, clinician shortages, lack of transportation, language barriers, insufficient health literacy, and physical limitations. Regardless of the reason, the avoidance or lack of needed care has a negative impact on health and may result in the deferral of treatment until a condition becomes more serious as well as in higher costs for both individuals and the health system.

Unmet need for medical care is a challenge that could be addressed with a variety of approaches and by a range of stakeholders. While the ACA increased access to health insurance by establishing insurance exchanges and expanding eligibility for Medicaid, millions of Americans still lack insurance coverage, a significant challenge for meeting the medical needs of the full population. Further, some areas of the country may have insufficient health care resources and staffing such that people are unable to receive timely appointments or lack the physical ability or transportation to reach a medical facility.

Best Current Measure

The Committee identified unmet care need as the best current measure for care access. Data on unmet care need are collected through a variety of measures and surveys, including the Agency for Healthcare Research and Quality's (AHRQ's) Medical Expenditure Panel Survey, which was initiated in 1996 (AHRQ, 2009), and the NHIS. The NHIS unmet need survey instrument assesses inability or delay in receiving needed medical care, dental care, or prescription medications, and it considers affordability and lack of sufficient insurance as potential causes. A variety of other survey mechanisms, including the Consumer Assessment of Healthcare Providers and Systems (CAHPS) Clinician and Group survey, collect data on various aspects of access to care and unmet medical need. In addition, the data on unmet care need can be stratified by different geographic, demographic, and socioeconomic subpopulations, enabling comparisons for populations of interest. According to the NHIS, for January-June 2014, an estimated 5.4 percent of the population failed to obtain needed medical care because of cost at some point during the past 12 months (CDC, 2014a).

Access to care is an area in which significant change is under way as a result of the enactment and implementation of the ACA, which expanded access to other care resources in addition to insurance and placed limits on out-of-pocket spending. As the impact of these changes unfolds, new measures may need to be developed to accord with the evolving landscape of what access means in the context of the American care system.

Related Priority Measures

Alternative measures considered by the Committee include usual source of care, delay in initiation of needed care, lack of health insurance, and underinsurance. While each of these measures provides important information about aspects of care access, unmet need encompasses the broadest range of causes and consequences of lack of access to care. In addition to unmet need, the Committee selected usual source of care and delay of needed care as related priority measures that provide detail about different foci of access to care. Usual source of care can be used to assess not only whether people receive care but also whether they receive it in a consistent and predictable way from a known source. Delay of needed care provides additional detail about the gray area between receiving and not receiving care, in which people may choose to delay or ration their care so as to reduce or avoid medical costs.

Disparities

Unmet medical need, as defined by the percentage of people who delay or avoid needed care, exhibits disparities in terms of race and ethnicity, gender, education, residency status, and poverty status, as reported by the CDC (see Figure 4-13). In 2012 nationwide, an estimated 10 percent of people delayed seeking care because of cost. Unmet need was greater for women, at 11 percent, than for men, at 9 percent. In terms of race and ethnicity, 10 percent of white individuals delayed receiving care, compared with 11 percent of African Americans, 9 percent of American Indians/Alaska Natives, 6 percent of Asians, 13 percent of people who identified as two or more races, and 11 percent of individuals of Hispanic or Latino origin. Poverty also affects unmet medical need, which was experienced by 28 percent of poor individuals compared with 9 percent of those living between 250 and 400 percent of the federal poverty level (CDC, 2014c).

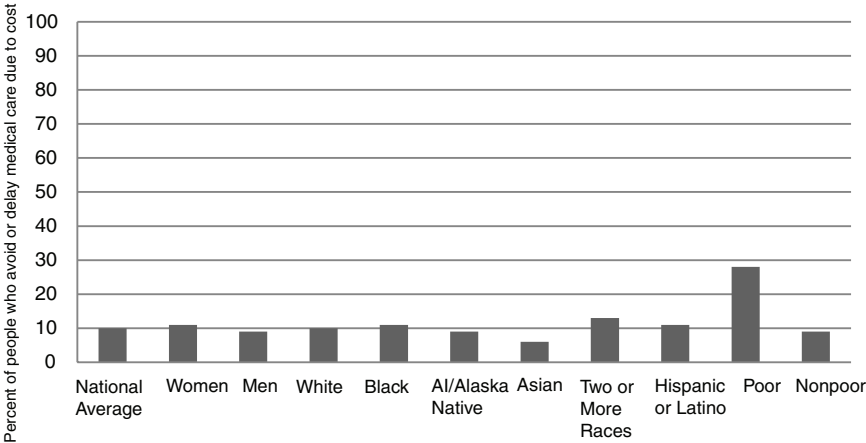


FIGURE 4-13 Percentage of people who delay medical care because of cost across demographic groups, 2012.
NOTE: AI = American Indian.
SOURCE: CDC, 2014c.



Patient Safety

Importance

Avoiding harm is a primary obligation of the health care system, yet despite the steadily declining hospital mortality in the United States, one of every three hospitalized patients may be harmed during their stay, and one of five Medicare patients are rehospitalized within 30 days of admission (IOM, 2012a). These harms often are associated with certain risk factors, such as the use of indwelling medical devices, surgical procedures, injections, contaminations of the care setting, and misuse of antibiotics. Infections acquired in care settings are estimated to have an economic cost in the billions and to contribute to tens of thousands of lives lost each year (HHS, 2014b). Ensuring that patients are safe in all their interactions with the health care system requires a systematic, coordinated approach to the provision of care services, as well as a culture of care that makes safety a priority. Patient safety also is a critical challenge for providers outside of the hospital setting. For example, misuse or overuse of opioids, often the result of poor prescribing practices, can pose a significant risk to patient

safety, a challenge that includes such stakeholders as community providers, pharmacists, and local and state health agencies.

Avoiding adverse events is a complex challenge without a singular or simple solution, in part because measures of these events include counts of several different types of events. The CDC data also show that significant progress has been made since 2008 in reducing hospital-acquired infections. Making progress toward reducing the incidence of adverse events requires the coordinated action of a range of stakeholders not only within the provider community but also among patients and their caregivers.

Best Current Measure

The Committee identified hospital-acquired infection rate as the best current measure for patient safety. Data on avoidable adverse events are available from many sources, with some studies suggesting that certain adverse events are underreported (Seiden and Barach, 2006) and others suggesting that claims-based measures may have significant error. The CDC's Healthcare-Associated Infection prevalence survey provides an annual national estimate for the incidence of some of the most common health care-associated infections in hospitals, and these data are considered both reliable and valid. An estimated 648,000 patients in acute care hospitals had at least one health care-associated infection, converted for presentation purposes to a rate of approximately 1,700 per 100,000 using data on annual admissions and discharges from the Healthcare Cost and Utilization Project's (HCUP's) National Inpatient Survey (Magill et al., 2014; Pfuntner et al., 2012). Health care-related adverse events also are monitored via the National Healthcare Safety Network and the Emerging Infections Program (CDC, 2014b). Some states require reporting of wrong-site surgeries, although there is no uniform nationwide reporting system for these incidents. Improvement and standardization are necessary for this measure.

A preferred measure would be a composite measure for patient safety that would reflect patient safety more broadly by integrating performance with the most important patient safety events, mapped against a fuller range of patient care settings. Such a composite might include wrong-site surgeries, hospital-acquired infections, medication reconciliation, and pressure ulcers. Although the formal specification of such a composite core measure will require careful research and testing to ensure that the measure reflects as clearly as possible the state of patient safety, the development of composites for this and other measures where current data are lacking is a priority for the implementation of core metrics.

Related Priority Measures

Alternative measures considered by the Committee include blood infection from intravenous (IV) lines, treatment-associated infections, patient safety measures, and never events such as wrong-site surgeries. In addition to the best current measure of care-associated infections, the Committee identified a second priority measure: unnecessary care. This measure is a step removed from but closely related to the concept of patient safety. As such, it may be useful for certain stakeholder groups with more specific interest in this area. Unnecessary care targets the overuse of certain services or care resources, driven in part by fee-for-service models of care that emphasize volume of services and reflected, for example, in the Choosing Wisely services unsupported by evidence (ABIM, 2014).¹

Disparities

Variations are seen in the incidence and severity of patient safety events for some population subgroups, although additional research is needed to articulate the relationships between demographics and patient safety events. For example, an analysis of AHRQ data on patient safety incidents among veterans found that rates of postoperative hemorrhage or hematoma were highest among African Americans, while African Americans had the lowest rate for another patient safety incident, foreign body left during a procedure (Shimada et al., 2008). Another study found that Hispanic patients had better outcomes than white patients on 7 of 14 patient safety measures, although incidence rates were higher for Hispanic relative to white patients for two additional measures (Russo et al., 2006a).

Interpreting variations in the incidence of patient safety events can present an analytic challenge because of underlying variations in risk factors such as hospitalization rates and comorbidities. Additional measure development is needed to ensure that disparities in avoidable adverse events are monitored and addressed in health and health care improvement activities.

¹ Choosing Wisely is an initiative of the American Board of Internal Medicine (ABIM) aimed at identifying and eliminating unnecessary medical procedures and expenses.



Evidence-Based Care

Importance

The quality, effectiveness, and consistency of care depend on the application of evidence to clinical circumstances. One of the central challenges for the American health system is ensuring that care delivered is based on the best available scientific evidence for appropriateness and effectiveness. While advances in medicine and health care have led to substantial gains in life expectancy and quality of life over time, many people still fail to receive recommended care or receive care that is not based on scientific evidence. One study found that people receive only about 55 percent of recommended care (McGlynn et al., 2003). As clinical research has progressed for various conditions, new ways of assessing predispositions to disease, as well as treating conditions, have been developed, and these are targets of the rapidly proliferating measurement requirements. Ironically, the plethora of measures has taken on a reductionist character, focusing attention narrowly rather than on activities with broad-based impacts on improving systems of care across the spectrum.

This proliferation of measures also deflects attention from things that ought not to be done. Choosing Wisely highlights the extent to which today's health care practices are out of line with the evidence. Through the work of Choosing Wisely, more than 60 medical specialty societies have identified lists of "things physicians and patients should question," highlighting common practices or procedures that are often overutilized or poorly deployed. For example, the American College of Physicians recommends against obtaining imaging studies for nonspecific low back pain, the American Academy of Pediatrics recommends against the use of antibiotics for viral respiratory illnesses, and the American College of Obstetricians and Gynecologists recommends against annual Pap tests for women aged 30 to 65 (ABIM, 2014). These lists, which are provided in formats for both physicians and patients, are intended to encourage conversations between doctors and patients about care that may not be supported by evidence and, in the process, to promote better alignment between clinical practice and evidence and assist patients in actively engaging in decision making about their care.

Best Current Measure

The Committee identified preventable hospitalization rate as the best current measure for evidence-based care. The Committee found that an

appropriate, valid measure for the proportion of all care delivered that is based on evidence is lacking, in part because of the condition-specific nature of the data required to assess appropriateness. Several national registries include data on appropriateness, and efforts are under way to expand requirements for the collection of data on appropriateness across a broad spectrum of treatments and procedures. Nonetheless, the lack of an existing measure forced the Committee to consider proxy measures for this target. The Committee selected preventable hospitalizations as a proxy for the short term because it incorporates both the provision of appropriate health care services and the community factors that contribute to patients' ability to manage their own care.

Data on preventable hospitalizations are available from a variety of sources, and several different definitions are in routine use, including National Quality Forum (NQF)-endorsed measures from Bridges to Excellence (NQF #0704, 0708, 0705, 0709), as well as measures of readmissions developed and used by National Committee for Quality Assurance (NCQA) and others (NQF# 1789, 1768). The Centers for Medicare & Medicaid Services (CMS) also administers the Hospital-Acquired Condition (HAC) Reduction Program, which was established by the ACA to promote improvement in patient safety in hospital settings by tying performance incentives to payment (CMS, 2014a). AHRQ collects data on preventable hospitalizations through the HCUP. These data are derived from administrative records and are available at the national and state levels, as well as for Medicare, Medicaid, and private insurance. The HCUP estimate is 3.9 million preventable hospitalizations per year. For presentation purposes, this estimate was computed to a rate based on the HCUP 2010 National Inpatient Survey, which reported 39 million hospital stays per year, yielding a rate of about 10,000 per 100,000 avoidable hospitalizations (Pfuntner et al., 2012; Torio and Andrews, 2013).

Preventable hospitalizations represent a failure of the health system to provide adequate care in advance of an acute medical event. However, a broad range of factors may contribute to preventable hospitalizations, including issues of access, the availability of ambulatory resources, communication with patients, care coordination, and social services. Thus, preventable hospitalizations is a relevant measure that captures accountability for a broad range of stakeholder groups.

At the same time, the Committee identified this as one of the most important areas for the development of a composite, standardized, systems-oriented proxy, in particular because of the rapid growth in untested measures with a narrow focus. An ideal measure would take the form of a composite that would reflect evidence-based care more broadly, integrating standardized performance on the delivery of care that follows established protocols for the most urgent and most common conditions and

failures to follow protocol without adequate justification. This measure could be tracked through a blend of sampling, electronic health records, and multi-payer databases. A composite measure for evidence-based care might include assessment of the use of basic, proven protocols whose implementation requires the culture and practice of focus on proven care, including protocols for treatment of heart attacks, stroke, diabetes, high blood pressure, surgical care, and mental health, as well as such measures as preventable hospitalizations that cut across disease and treatment categories. Significant research and pilot testing will be necessary to ensure that such a measure (or measures) performs appropriately and provides an accurate view of the state of evidence-based care delivered in a particular setting. Developing standardized composites for this and other measures where current data are lacking is among the highest priorities for the implementation of reliable core metrics.

Related Priority Measures

Alternative measures considered by the Committee include chronic disease management, readmissions, cardiovascular risk reduction, and elective delivery. While each of these measures provides important information about a key aspect of evidence-based care and appropriate treatment, preventable hospitalizations encompasses the broadest range of potential causes and conditions and also reflects such key health system performance issues as communication with patients, availability of ambulatory resources, care coordination, and social services.

The Committee identified three related priority measures for which certain data sets are available: cardiovascular risk control, hypertension control, and diabetes control, each representing a critical area of evidence-based care. These three measures deal with major chronic diseases and the extent to which they are managed by both clinicians and patients, and their selection reflects the significant and growing impact of these behavior-linked diseases on both the health of Americans and the cost of American health care.

Disparities

Data on preventable hospitalizations illustrate significant disparities in care across racial and ethnic groups. For example, one study found that, controlling for population size, approximately 500,000 more hospitalizations occur in low-income neighborhoods relative to high-income neighborhoods. Similarly, non-Hispanic blacks and Hispanics have significantly higher rates of hospitalization than non-Hispanic whites (Moy et al., 2013). One survey found that hospitalizations for chronic diseases were three to

five times higher for black respondents relative to non-Hispanic white respondents (Russo et al., 2006b). Additional measure development is needed to ensure that disparities in preventable hospitalizations are monitored and addressed in health and care improvement activities.



Care Match with Patient Goals

Importance

The IOM report *Crossing the Quality Chasm: A New Health System for the 21st Century* identifies patient-centered care among its six aims for improving the quality of health care, stating that high-quality health care must be “respectful of and responsive to individual patient preferences, needs, and values” and that patient values should be considered as a factor in all clinical decision making (IOM, 2001). The Committee sought to identify a measure that would express the degree to which health care meets this goal by being aligned with and responsive to patients’ values and needs, but that also would go further to emphasize determination, consideration, and integration of patient and family goals in the care process.

Measuring patient-centeredness accurately and consistently can enable better understanding and new approaches for ensuring that the health care system responds to the needs and values of patients. Routine and consistent integration of patient and family goals and perspectives into care planning and decisions represents a cultural shift in the prevailing patterns of health and health care, and measurement is needed to assess progress and identify best practices. This entails more than just access to health information, decision support, and transparent pricing, which are necessary but not sufficient elements of the care match with patient goals. A variety of measures targeted at patient-centered care have been developed and tested, although significant measure development in this area is still needed. Examples include the Dartmouth CollaboRATE measure, the Patient Enablement Index, and the NCQA Patient-Centered Medical Home standards.

Best Current Measure

The Committee identified patient-clinician communication as the best current measure for care match with patient goals. One of the most widely used tools for assessing patient-centeredness and patient engagement is the CAHPS surveys, the methodological development for which was supported by AHRQ. While the Committee concluded that an ideal measure

for this focus is lacking in the field today, the measure for patient experience included in the CAHPS survey could serve as a proxy in the short term. CAHPS was launched in 1995, and has collected data on patient experience via a variety of instruments. In addition to nationwide annual data collection, the CAHPS survey and methodology are widely used in assessing patient satisfaction for individual institutions, particularly in scoring patient experience using the measure discussed here.

The CAHPS composite measure of patient–clinician communication has been extensively validated, is known to be reliable on the dimensions surveyed, and is in wide use throughout the nation. It incorporates six survey questions about patients’ perspectives on how well their clinicians communicate, listen, and respond to their needs and values (AHRQ, 2012). The CAHPS results include patients with insurance coverage from Medicare, Medicaid, and commercial plans, but they do not include the uninsured population. The 2013 CAHPS Clinician and Group Survey found that 92 percent of people report the highest level of satisfaction with patient–clinician communication (AHRQ, 2014).

A limitation of the CAHPS patient–clinician communication measure is that scores are typically above 90 percent, both for the nation and for individual institutions. This leaves limited room for improvement, and may suggest that new or different measures are needed.

A more ideal measure of the extent to which care matches patients’ goals might take the form of a single carefully constructed measure or composite that would reflect with greater specificity the extent to which the care process effectively identifies patient and family goals, delivers the information necessary for decisions, and works actively and successfully toward attaining those goals. A composite might include such issues as patient–clinician communication, shared decision making, advance care planning, and patient satisfaction. Developing composites for this and other measures where current data are lacking is a priority for the implementation of core measures.

Related Priority Measures

Alternative measures considered by the Committee include use of shared decision making, patient ratings of providers, end-of-life care, and likelihood of recommending. While each of these measures provides important information about the extent to which health and health care align with patient goals, people’s reports of satisfaction with their clinician’s communication encompass a broad range of potential issues and concerns. In addition to the best current measure of patient–clinician communication, the Committee identified two related priority measures: use of shared decision making and end-of-life care. Although additional research and measure

development are needed in this area, patient and clinician participation in shared decision making increases the likelihood that care will align with patient goals and thus, at present, constitutes a reasonable measure of the attainment of this objective. This measure may be useful for stakeholders taking specific actions in the area of shared decision making and meaningful care, such as those involved in the development of decision aids and other resources to empower patients to take an active role in their care. End-of-life care represents a critical area in need of significant development in terms of both care and its measurement, and one in which patient and family views and perspectives play a critical role.

Disparities

The CAHPS composite measure on patient–clinician communication reveals disparities in health outcomes and responses, notably across geographic regions (see Figure 4-14). For example, 90 percent of people in the Western region of the United States report a high level of satisfaction with patient–clinician communication, while that number is 92 percent for all survey respondents (AHRQ, 2014). Note that although these differences may be statistically significant, they may not be clinically significant.

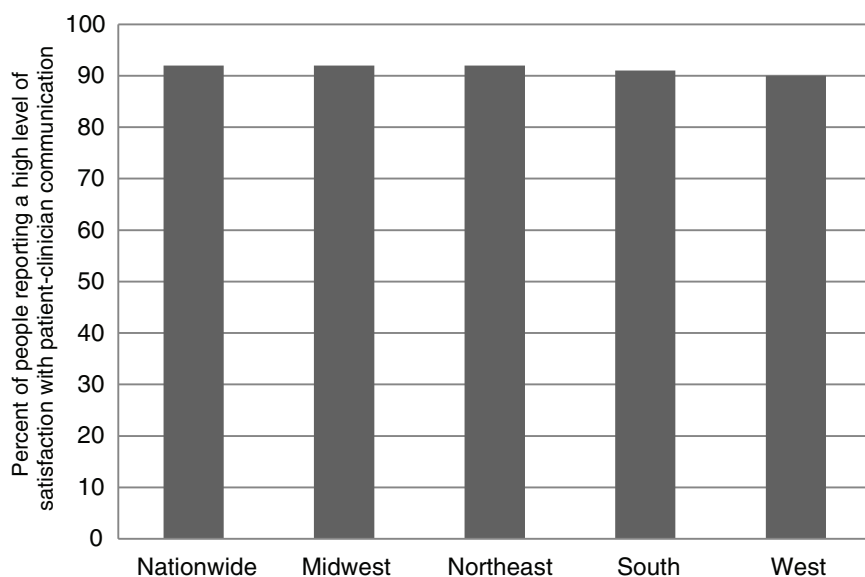


FIGURE 4-14 Quality of patient–clinician communication by region, 2013.
SOURCE: AHRQ, 2014.



Personal Spending Burden

Importance

As discussed in Chapter 1, the United States spends more on health care than any other country, even after adjusting for the cost of living, yet the overall health status rankings for Americans are far from the best in the world. This mismatch between cost and quality has adverse impacts not only on people's health and well-being but also on their economic security. Care that is too expensive limits people's access to care, delays the receipt of necessary care, and diverts resources from other needed goods and services.

Individual spending burden provides an indication of the financial burden imposed by health care on households and, by extension, the limits that health care may place on other areas of consumer spending. As noted, for example, high spending on health care may limit individuals' or families' ability to afford other essential goods and services, or it may limit the discretionary income that would otherwise go toward other sectors of the economy. One study found that among families reporting difficulty paying medical bills, more than half sacrificed such other necessities, as rent or food, to pay for care. Additionally, approximately half reported that they borrowed money to pay medical bills (Cunningham, 2008). Health care costs also contribute significantly to personal bankruptcies in the United States, although the magnitude of this contribution is debated (Gross and Notowidigdo, 2011; Himmelstein et al., 2009). The average level of health care spending provides a sense of the impact of high costs on the economy as a whole, but the distribution of that burden among families reveals how many face hardship as a consequence of high health care costs. Protection from excess financial exposure is a key goal of the health care system.

Best Current Measure

The Committee identified high spending relative to income as the best current measure for personal spending burden. Income devoted to health care—represented in Figure 4-15 as the percentage of people who are uninsured or underinsured (defined as spending more than 10 percent of income on health care, or 5 percent for low-income individuals)—covers a broad range of issues related to affordability and is easily communicated and understood because of its high level of relevance for individuals. The Commonwealth Fund reports that 46 percent of adults spent more than 10 percent of their income on health care (5 percent if poor) or were uninsured in 2012 (The Commonwealth Fund, 2013).

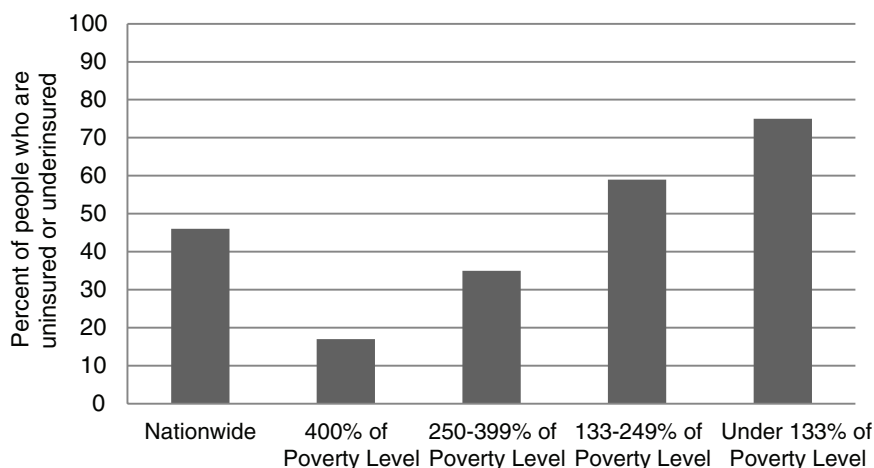


FIGURE 4-15 Percentage of people who are uninsured or underinsured (meaning they have no insurance, or they have insurance and spend more than 10 percent of their income on health care, or 5 percent if they are low-income).

SOURCE: The Commonwealth Fund, 2013.

Data on health care affordability come from a variety of sources and are specified in a range of ways, including per capita spending on health care; rates of uninsured and underinsured; and more complex estimates that break down out-of-pocket spending according to payroll deductions, copays, coinsurance, and other cost sharing. These data have been collected for many years using standardized methods and are reported regularly through government agencies as well as by a variety of health organizations, including The Commonwealth Fund. They serve as a reliable, actionable measure of the extent to which people are able to afford the care they need. The Commonwealth Fund provides biennial estimates of the proportion of Americans who are uninsured and underinsured. In the exceedingly expensive U.S. health care system, individuals lacking insurance are highly likely to incur health care expenditures that are unaffordable in relation to their income. Underinsurance goes a step further to capture the adequacy of insurance among the insured. Because of the increasing prevalence of high-deductible plans with substantial copays, even insured individuals can find care unaffordable relative to their income. The ACA regulations governing the adequacy of insurance both within and outside newly created state and federal marketplaces may affect levels of underinsurance in the United States. Therefore, this measure may need regular updating.

Related Priority Measures

Alternative measures considered by the Committee include out-of-pocket costs, total cost of care and resource use, waste, and percent uninsured. While each of these measures provides important information about a key aspect of affordability, the Committee selected health care-related bankruptcies as a related priority measure. This measure, which captures the downstream effect of spending that exceeds individuals' ability to pay, may provide additional information for certain stakeholder groups

Disparities

Based on income devoted to health care, 75 percent of working-age adults with income below 133 percent of the federal poverty level have experienced a period of time without health insurance or were underinsured during the previous year (see Figure 4-15). In contrast, 46 percent of all adults nationwide are uninsured or underinsured, spending more than 10 percent of income on health care, or 5 percent if they are low-income (Collins et al., 2013). This measure clearly emphasizes the socioeconomic disparities, among others, that are characteristic of health care spending among U.S. consumers.



Population Spending Burden

Importance

In addition to its burden on individuals, health care spending consumes a large portion of the nation's gross domestic product (GDP), substantially exceeding the relative investments of other economies in health care. Since 1985, health care spending per person has grown at a faster pace, on average, than the economy (CBO, 2013). In 2011, national health expenditures accounted for 17.9 percent of GDP; by 2022, that figure is projected to be 20 percent (CMS, 2012). While health care costs have grown more slowly than projected over the past decade, the magnitude of spending on care remains a significant challenge for the U.S. economy, and it has led to a growing trend of initiatives aimed at curbing costs through performance-based payment, accountable care, and other models that challenge the standard approach of payment based on volume of services. Population-level

spending on health care may crowd out other individual and collective investments, including investments in areas with the potential to have positive impacts on health outcomes, such as public health, social services, education, and community development. Compared with other developed countries, the United States also spends disproportionately little on social services, which may lead to a greater need for medical care and treatment as well as to poorer health overall.

Maintaining sustainability in spending on health care is a complex challenge, the management of which involves a wide range of stakeholders, from pharmaceutical and device manufacturers to hospitals to regulators. Ensuring the financial sustainability of the health care system is a compelling priority for the health system writ large, and achieving meaningful change in the costs and prices of health care will require coordinated efforts from all accountable stakeholders.

Best Current Measure

In identifying the proportion of economic resources spent on health care as the best current measure for population spending burden, the Committee is underscoring the importance of considering the issue not only at the national level (health as a percentage of GDP for the nation) but also at the state and local levels and even at the institutional level. CMS reports that in 2013, national health expenditures accounted for 17.4 percent of GDP, or more than \$9,000 per person (CMS, 2014c). The Committee considered the possibility of including a third cost measure for institutional spending burden, which would focus on spending at health care institutions, but concluded that, given the shift in health care toward population-based approaches, a two-component formulation of population versus institutional spending burden would be preferable. Additionally, given the limits of data on population spending below the national level, institutional measures such as total cost of care and resource use could serve as population spending burden measures for health care stakeholders in the short term while, ideally, better measures will be developed that will enable comparison of spending burden across levels and institutions.

Data on health care spending as a share of GDP are available routinely from CMS and are collected and reported using standardized methods. Annual estimates of total health care spending nationwide, called the National Health Expenditure Accounts, date to 1960 (CMS, 2014b). The data provide quick, readily comparable estimates for national spending on health care over time. While national GDP is a common, accepted metric for economic spending and growth, measures also could

be developed to provide additional clarity on the state of population spending burden at various levels. For example, spending on health—as distinct from health care—could provide a broader look at spending outside the care system. Similarly, various breakdowns of spending by category, such as public health, prevention, chronic disease, and end-of-life care, could be useful to stakeholder groups with particular interests in certain spending areas.

Related Priority Measures

Alternative measures considered by the Committee include the rate of spending growth relative to GDP, total cost of care, and spending relative to peer countries. While these measures provide important information about the sustainability of health spending, proportion of GDP devoted to health care provides a simple, accessible estimate for the impact of health care spending on the nation's economy. In addition to proportion of economic resources spent on health care, the Committee identified three related priority measures for population spending burden: total cost of care, spending growth, and growth in health care spending versus GDP growth. These additional measures represent different focal areas within population spending, and are intended to enhance the usability of the core measure for certain subgroups. For example, the percentage of spending devoted to health care would be of limited meaning to a health care institution. However, total cost of care provides actionable information about the state of spending at a health care institution, as well as potential areas of waste or misallocation of resources. Similarly, growth in spending on health care relative to growth in GDP provides additional context for and detail about performance over time.

Disparities

Proportion of GDP devoted to health care does not break down naturally in terms of disparities, so such data are not reported here, and the Committee does not recommend this as an area for measure development. However, share of GDP devoted to health care provides useful information about relative performance on the overall magnitude of health care spending—and the potential opportunity cost associated with any portion of that spending that is used inefficiently or wasted—relative to other countries (see Figure 4-16), as well as among states or localities that routinely calculate spending on health care.

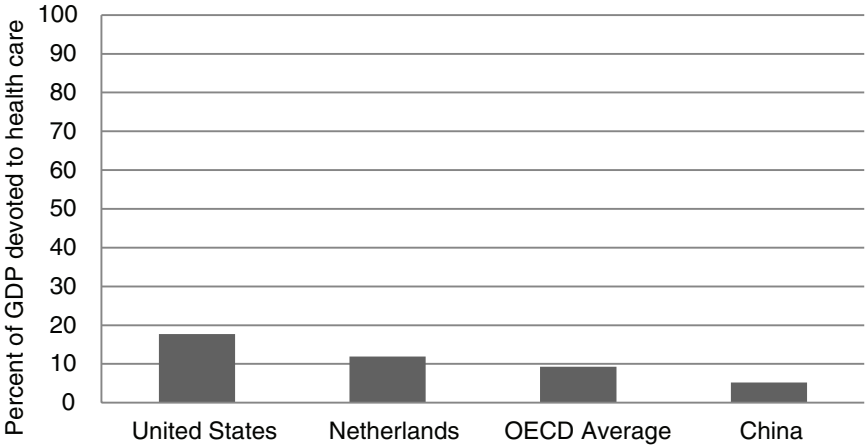


FIGURE 4-16 Health expenditures as a share of the gross domestic product (GDP): United States, the Netherlands (next highest-spending country), OECD countries, and China.
SOURCE: OECD, 2013.



Individual Engagement

Importance

People play active roles in their own health and the health of others, and their level of engagement can have important implications for the quality of their health and care, as well as their families, and of others in their communities. This engagement includes choices about diet, exercise, lifestyle, and other behaviors that have well-known implications for the development of chronic disease and other health consequences, as well as the extent to which people are prepared with the necessary knowledge, skills, and tools to play an active, meaningful role in the influence of community factors on their health and health care as well as that of others. Individual engagement means that individuals and families play an active role not only in their care but also in the range of factors that contribute to their health, including environment, community, economy, social well-being, and more. Individuals who are actively engaged are in a state of readiness for health, with the knowledge, skills, and tools to maximize their individual and family well-being.

Improving individual engagement is complex and involves a broad range of stakeholder groups. Addressing this problem presents an opportunity for

improving an array of health outcomes as well as for enhancing people's engagement in and ownership of their own health and the quality of their interactions with the health system.

Best Current Measure

The Committee identified the health literacy rate as the best current measure for individual engagement. An IOM study found that 90 million people, or nearly half of all American adults, have relatively low health literacy, characterized by difficulty understanding and using health information. These people also tend to have higher rates of hospitalization (IOM, 2004). Data on health literacy are limited and not collected in a routine or standardized way. In 2003, for example, the U.S. Department of Education estimated that 12 percent of adults had proficient health literacy (proficient being the highest performance level on a scale of below basic, basic, intermediate, and proficient), although data on health literacy are not collected routinely through the National Center for Education Statistics (NCES). Additional research is needed to develop high-quality, easily collected measures and data collection systems for health literacy.

Health literacy is a complex target for measurement, and additional measure development is needed to ensure that its key aspects and competencies are captured accurately and meaningfully. Comparability for small groups may be limited because of sampling effects or the nonrepresentative composition of a target population. Survey-based measures also can be expensive to collect when publicly available data are sufficient to meet local needs.

While health literacy looks at one critical component of individual engagement, additional research and measure development are needed to identify and articulate more fully the most critical elements of individual engagement and its associated outcomes. Because individual engagement is an emerging area for health and measurement, significant resources and development are needed to further articulate the concept and to develop high-quality measures.

A composite measure of individual engagement could reflect engagement more broadly, integrating determinants of the extent to which people are active participants in their own care processes and are working to influence the nature of the care they receive and its affordability and improvement, active users of the growing number of mobile tools that facilitate self-diagnosis and condition management, as well as the responsiveness of clinicians and public health leaders to their perspectives. Example elements could include health literacy; involvement in personal, family, and community health; and working actively to improve the health of oneself and others, as well as active involvement in promoting a health-oriented

community culture. Developing composites for this and other measures where current data are lacking is a priority for the implementation of core metrics.

Related Priority Measures

Alternative measures considered by the Committee include self-care, actively trying to lose weight, use of emerging m-health tools (see Chapter 2) that help move care to where the patient is, and family health. The Committee identified involvement in personal, family, and community health as a related priority measure. This measure encompasses additional facets of engagement, such as whether people are actively working to improve their health, the extent to which they are aware of and engaged in improving the health of their families, and their roles in community health.

Disparities

The 2003 Department of Education National Assessment of Adult Literacy found that while 12 percent of U.S. adults have proficient health literacy, this is the case for just 2 percent of black adults (see Figure 4-17). Although a broad-based health literacy survey is not conducted routinely, these differing numbers highlight prominent disparities in the health literacy of the U.S. population. Health literacy is highest among Asian/Pacific Islander adults, 18 percent of whom have proficient health literacy, followed by whites (14 percent), American Indians/Alaska Natives (7 percent), Hispanics (4 percent), multiracial individuals (3 percent), and blacks (2 percent).

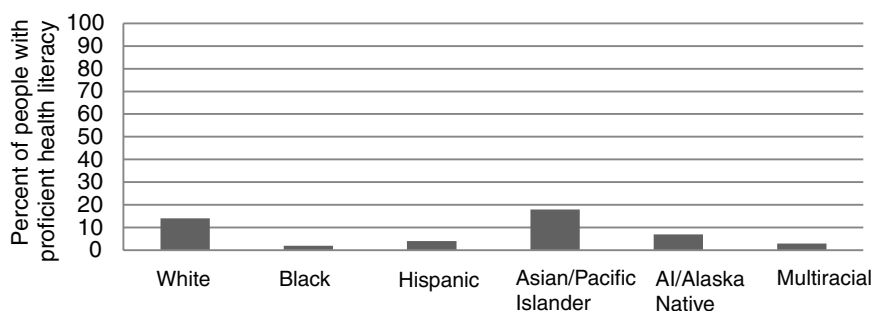


FIGURE 4-17 Disparities in health literacy: Percentage of people with proficient health literacy across demographic groups, 2003.

NOTE: AI = American Indian.

SOURCE: Kutner et al., 2006.



Community Engagement

Importance

In addition to engagement in health by individuals, a health-oriented community culture, as reflected in community priorities, investments, and initiatives, is important to improving individual and community health and health care. Across the United States, communities have different levels of resources available and utilized to support people's efforts to maintain and improve their individual and family health. For example, some communities may offer better access to and availability of certain health facilities and services, such as addiction treatment programs or emergency medical facilities. Similarly, communities vary in their citizens' involvement in various activities, such as elections or volunteering, as well as in their citizens' culture and level of social engagement. Community engagement represents the extent to which communities have the resources, capacities, and characteristics that can support efforts to improve health and health care.

Place plays a significant role in health; therefore, engaging the elements and stakeholders of the places where people live, travel, work, and relax is critical to maintaining and improving the nation's health. Sanitation, nutrition, workplace safety, pollution, and a range of other factors have an important role, and engaging these elements in health improvement efforts is critical. Healthy places, in turn, create healthy people who are better able to participate in civic life, in industry and innovation, and in every other circle of community activity. It has repeatedly been demonstrated that the development of infrastructure, sanitation, and policies focused on public health and the environment leads to gains in health and quality of life (McGinnis and Robinson, 2013).

Community engagement also has significant linkages with other core measure foci, including well-being, healthy communities, and individual engagement. Thus, measuring community engagement provides an opportunity to explore and assess the conditions necessary to achieve improvements in individual and population health outcomes. In some cases, for example, health interventions can take the form of home repairs, air-conditioning, or improvements in transportation. Undertaking these types of interventions presents a challenge, however, as they fall outside the scope of the care system that connects patients with typical health services. Community engagement can fill this gap by enabling coordination of health services with other sectors such as the environment, labor, and infrastructure, as well

as by connecting people with critical environmental, social, and economic resources and interventions.

Improving the nation's health depends as much on the actions of communities of people as on the progress of the health care system and its institutions. Enabling and encouraging communities to take an active role in improving their health presents a significant opportunity for improving health and health care and brings together a broad range of stakeholder groups.

Best Current Measure

The Committee identified social support as the best current measure for community engagement. Data on social support are collected annually via the CDC's Behavioral Risk Factor Surveillance System (BRFSS), an ongoing telephone-based health survey system in operation for more than 30 years. The BRFSS has been extensively validated and is considered reliable, and its results are reported regularly by the U.S. government using standardized methods. Social support is defined in the BRFSS as the extent to which people report having the social and emotional support they need (Robbins et al., 2014). Comparability for small groups may be limited because of sampling effects or the nonrepresentative composition of a target population. Survey-based measures also can be expensive to collect when publicly available data are sufficient to meet local needs. Based on analysis of the CDC BRFSS data, it is reported in the County Health Rankings that 19 percent of people experience inadequate social and family support (Catlin et al., 2014).

The Committee considered a range of measures relevant to community engagement, including community readiness, diet, transportation, and social support. While each of these measures provides important information about a key contributor to health, the Committee selected social support as a proxy for the short term, as it provides an indication of the degree of support people feel they have in certain aspects of their health, as well as the extent to which people are actively working toward improved health. Figure 4-18 shows the percentage of U.S. adults reporting inadequate social support nationally and in the best- and worst-performing states.

Significant research and development are needed to articulate this core measure focus more fully, both conceptually and in terms of data and measures. A preferred measure for this focus might take the form of a composite, reflecting community engagement more broadly and integrating elements related to community level of effort in improving health—the existence of community-wide agendas, the use of community benefit funds, opportunities for public input, and growth in resources developed. Various initiatives, such as the Dignity Health Community Need Index, the County

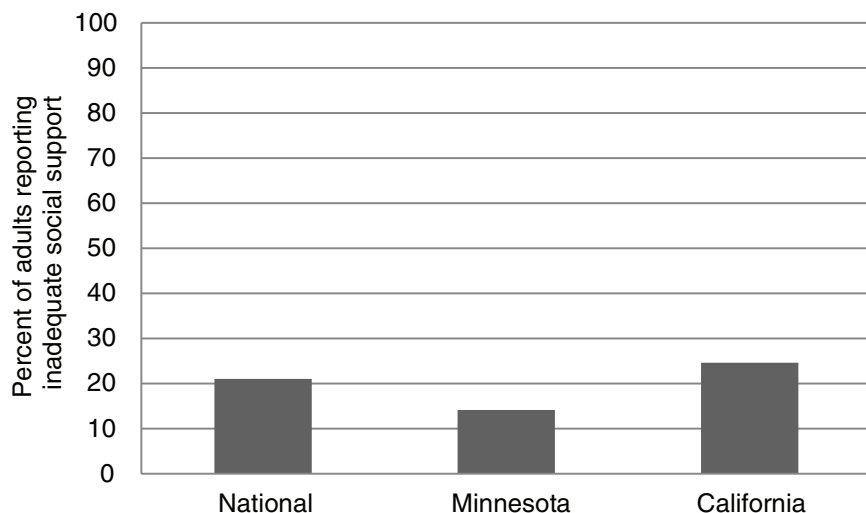


FIGURE 4-18 Percentage of adults reporting inadequate social support: National, and best- and worst-performing states, 2006-2010.

SOURCES: www.healthindicators.gov; The Commonwealth Fund, 2014.

Health Rankings, and the Community Health Assessment and Group Evaluation Tool, represent efforts to better understand and assess a range of elements important to community engagement, although further measure development is needed. A composite measure of community engagement might include the following elements: communities with active health agendas, including cooperative multi-institutional plans for meeting community benefit obligations, and communities that advocate for local health improvement. Development and pilot testing of composite measures in this and other areas is a key priority for the implementation of core measures.

Related Priority Measures

Alternative measures considered by the Committee include health-related community activities, availability of healthy food, green space, walkability, public transportation, and political involvement. In addition to social support, the Committee selected two related priority measures for community engagement: availability of healthy food and walkability. These measures were selected as critical elements that highlight some of the myriad features of communities that promote or indicate a meaningful engagement with health and can be reflective of policies, leaders, and employers that place a high value on promoting and maintaining health.

Disparities

Social support varies significantly for different population subgroups, and these variations can contribute to disparities in health outcomes. For example, one study found that 28 percent of African Americans reported that their friends helped them if needed fairly often, compared with 40 percent of white respondents (Shim et al., 2012). Additional measure development is needed to ensure that disparities in social support are monitored and addressed in health and health care improvement activities.

DEVELOPING, APPLYING, AND IMPROVING THE CORE MEASURES

Although Table 4-2, presented earlier, provides preliminary estimates for national performance on each of the core measures, refinement and elaboration is required for many. As indicated throughout this chapter and discussed more extensively in Chapter 5, fully implementing the core measures will require substantial developmental work to ensure that the measures in use are of the highest quality; are specified and operationalized consistently; reflect a broad range of stakeholder perspectives; and are applicable at the national, state, local, and institutional levels. It will also be necessary to ensure that the associated data are widely collected and readily available both to inform stakeholder actions aimed at health and health care improvement and to enable meaningful comparison of health outcomes across the nation.

That detailed work is beyond this Committee's capacity and charge, and in fact must engage directly the multiple stakeholders involved. However, input, insights, and recommendations on the approach to this work are offered here and in Chapters 5 and 6.

Building the Needed Measures

The first step is to look beyond the available and at the horizon of the possible. For many of the core measure foci, significant research and development are needed to build measures and data streams that are true reflections of the most critical facets of American health. For example, the preventable hospitalizations measure takes a narrow, limited view of evidence-based care, the core measure focus it is intended to represent. It considers only one care setting, hospitals, as well as being narrowly focused on acute care, when evidence should be foundational to care across settings and conditions, including patient self-care. Additionally, the definition and measure specifications for preventable hospitalizations are applied inconsistently throughout the nation. For example, a search for "preventable

admissions” in the National Quality Measure Clearinghouse returns 42 different measures. Likewise, the measure inventory of the Department of Health and Human Services shows 16 different measures for readmissions, many focused on a particular condition or population.

While current capacity for measuring the most critical elements of health has a variety of limitations, data resources available today are significant and constantly growing and improving. From the Committee’s perspective, needed measures can be developed by moving forward with high-quality substitutes and proxies in areas where current measurement resources are limited and by targeting funding and other resources at filling high-priority gaps in data and measurement capacity. Building the measures needed to monitor the nation’s vital signs is likely to require refocusing resources on the standardization and adoption of uniform, interoperable, publicly available, publicly reported measures, as well as targeting measure development to the most critical areas in which new measures and methodologies are needed.

Applying the Available Measures

While the data and measures available today may be imperfect, many valid, standardized, reliable, and well-accepted measures are available that address key aspects of the core measure foci identified by the Committee. Applying the measures available today will be a critical step toward ensuring that the right measures are created and used in the future. Chapter 5 provides additional discussion of some of the most critical issues and implementation steps to be considered, including integration of the core measures with existing programs and requirements and considerations related to continuous updating and improvement of the core measure set. The Committee identified best current measures for each core measure to illustrate how the core measures could be applied in the short term, with the expectation that over the long term, improved measures would be developed, validated, and incorporated into the nation’s vital signs.

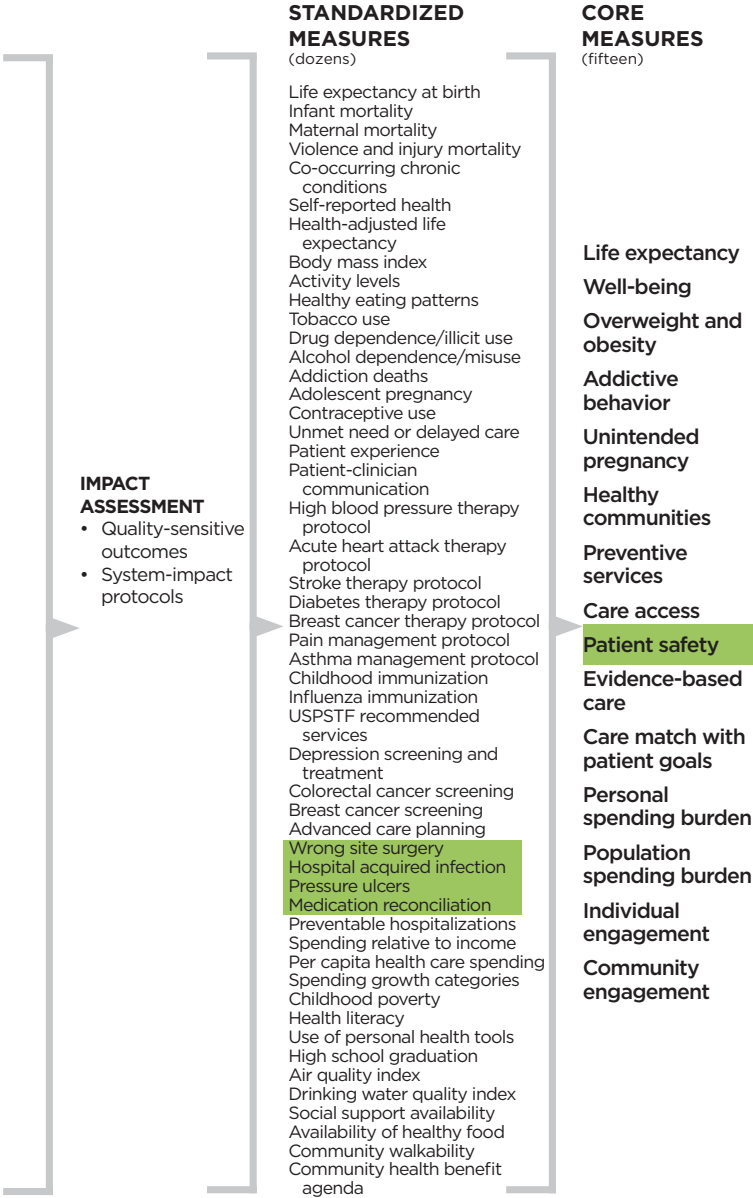
Establishing an Ongoing Process

The health and health care field is constantly evolving and, accordingly, the nation’s vital signs cannot be implemented statically. Rather, as new measures are established and vetted, and as priorities for American health shift, the nation’s core measures should reflect these changes. Establishing an ongoing process for this continuous evaluation and updating of the core measures is essential to ensure that focus is maintained on the health outcomes that matter most for the nation, measured as completely, precisely, and accessibly as possible. The considerations for and approach to this

process, with specific attention to programs and stakeholder groups with the significant opportunity to benefit from the core measures, are discussed in detail in Chapter 5. Additionally, the Committee's recommendations highlight the need for the steward of the core measures to consider and plan for the continuous evaluation and evolution of the core measure set.

Figure 4-19 illustrates how core measures could lead to reduced reporting burden in a particular measurement area. Patient safety measures, for example, are numerous and often represent slight variations of measures targeting the same basic concept. The far left column, "Measure Targets," provides a rudimentary taxonomy of the kinds of measures that are commonly reported today. In the patient safety realm, for example, there are many measures that target central line-associated bloodstream infection (CLABSI), Methicillin-resistant *Staphylococcus aureus* (MRSA), or pressure ulcers, among a variety of other key safety concerns and processes. While many of the individual safety measures in use today fall into similar categories, together they have created an uncoordinated assessment system in which a variety of different actors require reporting on safety in a variety of different ways, although the essential goal—monitoring patient safety—is essentially shared across stakeholder groups. The central box, "Safety Measures Currently in Use," highlights some specific safety measures reported today to illustrate the variety of specifications and measure types used to characterize the safety concept. By reexamining the range of measures in use today through the lens of quality, sensitive outcomes, and system-impact protocols, it is possible to reduce this panoply of measures of patient safety—as with each other measurement area identified—to a patient safety composite, as illustrated in the far right column, that works cooperatively with the full measure set to provide actionable, consistent information about health performance.

Figure 4-19 also illustrates, in a schematic sense, the growing measurement burden, how it might be reduced, and the role that core metrics would play in such a process, using the example of patient safety. Note that this pruning of the number of measures is intended to address the burden in reporting requirements rather than measurement activity at large. Measurement for purposes of monitoring or innovation at the institutional level would be expected to continue at the discretion of those involved. As discussed throughout this report, the Committee emphasizes that core metrics will not replace all other measures; in fact, they will require continued and standardized measurement of the key components of any composite. For example, all patient safety measures would not be replaced by a single measure—an improbable outcome—but rather, those measures for which reporting is required would be standardized, as illustrated in the "Standardized Measures" column, and those standardized measures would ultimately be compiled into a composite measure for patient safety.



NOTES: Beh: behavior; Can: cancer; Com: community engagement levels; CVD: heart disease and stroke; DM: diabetes mellitus; Env: environmental; HS: health status; ID: infectious disease; Ind: individual; MCH: maternal and child health; MH: mental health; OGQ: other and general quality; PC: personal cost; Pexp: patient experience; Prev: preventive services; Resp: pulmonary disease, including asthma; RR: relative resource use; Safe: safety; Soc: social; Surg: surgery; UN: unnecessary services.

This composite would add value by focusing attention not on individual activities but on the system's—and the organization's—overall production function with respect to patient safety. As discussed throughout the report, significant multi-stakeholder development work will be needed to identify, balance, and test the critical elements of such a composite.

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5

Implementation: Putting the Core Measures to Use

Core measures are basic to gauging the overall health of the nation; performance in health and health care at various levels; and how performance compares from organization to organization, community to community, state to state, and country to country. The availability of reliable standardized measures will make all of these assessments possible. But identifying the core measure set is merely the starting point; their uptake and use will be the real challenge.

Successful implementation of the core measure set will depend on its relevance, quality, and utility to stakeholders. The introduction of any new activity into a complex environment must account for the multiple competing priorities of stakeholders, the degree of change proposed, and the overall pace of change in the system. The U.S. health care landscape is already undergoing vast changes, including financial reform, improved access, the introduction of new technologies, better consumer access to health information, increased interest in primary care and prevention, and a stronger focus on accountability. Each of these changes carries the potential for new measure requirements and accompanying reporting burden, underscoring the importance of a new measurement framework—a framework that registers and reports overall system performance on the most vital dimensions in a comparable fashion at every level while reserving to local prerogative decisions on measures tailored to specific needs. Hence, the core measure set presented herein is prompted by the need for a paradigm change in the approach to assessment and reporting at all levels.

Although full system-wide implementation of the core measure set should pave the way for harmonization of disparate measures and reduction

of the measurement burden, core measures clearly are not intended to replace all other measurement efforts. Rather, core measures will provide a common platform upon which tailored but aligned measure sets can be constructed. The goal is to ensure the availability and utility of the most critical measures and information while affording greater local and institutional discretion on complementary measures that provide detailed information needed to empower performance improvement.

Measurement of a selected number of relevant targets should better direct efforts to improve the aspects of health that are most compelling to all. With appropriate organizational infrastructure to collect, store, share, and communicate data, the burden of measurement will likely be mitigated as less relevant measures are abandoned. Strategic introduction of the core measures should set the stage for their widespread adoption, utilization, and sharing across organizations and communities. In this way, core measures can serve as tools for measuring progress, recognizing shortfalls, informing and raising public awareness, sharpening focus at multiple levels, improving accountability, fostering diverse data linkages, facilitating informed patient choice, and establishing targets for community efforts. This chapter begins by reviewing in turn each of these practical applications of the core measure set. It then describes the uses of the core measures in assisting and assessing various large societal initiatives and in leveraging existing programs and requirements. Next is a discussion of implementation challenges for stakeholders at multiple levels. The final section addresses the crucial process of continuous improvement of the core measure set and each measure within it.

PRACTICAL APPLICATIONS

Measuring Progress

One of the primary purposes of measurement is to provide structured, objective information on performance. Such information enables comparisons of performance across different groups or relative to benchmarks. Similarly, performance on a set of measures enables assessment of the health system's functioning at multiple levels and of progress toward better health at lower cost. Focus on a core set of measures promotes learning and complementary action. When success in reducing overweight and obesity is achieved in a particular population or community, that progress, and the reasons for it, can offer insight and prompt action for others. Consistent, reinforcing measurement may not be essential for progress to occur—some progress is, after all, the product of new scientific knowledge or of other social or environmental changes—but the act of measuring what is most

important is almost certain to enhance the efficiency and effectiveness of improvement efforts.

Recognizing Shortfalls

Perhaps the most important result of measurement is to drive the recognition of shortfalls and to register failures, either for the population as a whole or for component groups. Only by recognizing that results are falling short relative to an expectation of what is possible given knowledge and resources, or relative to some comparison group, can the necessary attention, assessment, and action be mobilized to address the discrepancies. Currently, because information is gathered and reported unevenly and inconsistently in different places and at different levels, delays occur in recognizing even the most basic and important problems. If life expectancy for certain populations in the United States is actually declining, as has been reported for African American women in some counties, a special study should not be required to identify the development and to trigger assessment. It is a vital indication of a systemic problem that should be a constant and consistent focus of attention at every level.

Informing and Raising Public Awareness

Although the primary purpose of a core measure set is monitoring status and trends to accelerate progress or reverse setbacks, marshaling public support and demand for the necessary action requires a public sense of priority. Inherent in the parsimonious character of the core measure set proposed herein is the ability to educate the public—indeed, all stakeholders—about what is really most important to the nation’s health and well-being. Despite the fact that more and more health information is being publicly reported, uptake and assimilation of that information by the public is limited. The unsystematic presentation of existing quality, safety, and cost data, for example, has constrained the meaningfulness of the data to the general public (James, 2012). While clinicians may be affected by public reporting of the performance of providers or provider organizations, this information does not yet appear to be a major driver of consumer behavior in choosing a provider, with the possible exception of maternity care and certain elective procedures. For the public, a more accessible approach, based on simple marketing principles, is needed to build familiarity, comfort levels, and utility. The starting point is parsimony and consistency, which also will facilitate the use of presentation strategies that improve accessibility to and retention by the public.

Sharpening Focus

Just as the volume and inconsistency of reporting on health issues have impeded the public's grasp of the issues most meaningful to their health status and health prospects, the proliferation of measures has blunted the focus of stakeholders on the levers most important to the outcomes they seek. Measures most used for assessing progress may be those that are the most popular, the most controversial, or the easiest to implement, or those that simply have been in use the longest. They may not accurately reflect a community's or system's status or progress with respect to health, quality of care, or value. Measuring and reporting whether patients like their doctor, for example, offers little insight on the extent to which they are receiving treatment based on the best evidence or their care is aligned with the goals most important to them. By focusing consistently over time on a small number of high-priority measures, a core measure set affords the opportunity for decision makers at multiple levels—national, state, local, and institutional—to sharpen their focus and their cooperation on and coordination of priorities.

Improving Accountability

As focus sharpens through consistent attention to core measures, the opportunity for meaningful accountability will improve. Across the broad and diverse range of activities that make up the elements of health care in the United States, progress is measured in myriad ways with varying levels of validity and generalizability, and hence with varying certainty on the loci of responsibility. Most system incentives are organized around the delivery of and payment for various units of service rather than outcomes or performance at various levels. Using the common language of a core measure set to assess progress presents an opportunity to promote shared accountability across the health system for the goals that matter most for improving health at the national, state, and local levels. Similarly conveyed is the reality that health leadership at each of these levels also is accountable for reaching outside clinic doors to forge partnerships at the community level. Access to needed care for patients with diabetes, for example, is a function of more than simply wait times or insurance coverage; at its most basic level it also means mobilizing the community capacity to identify and engage those at high risk and to ensure follow-up through community-level resources. As population and health care system measures, the core measure set offers the prospect for a more meaningful and longer-term view of accountability.

Fostering Diverse Data Linkages

Effective, efficient, well-coordinated system-wide efforts to improve health depend on seamless access to information and data from multiple sources and levels of the health care system. Data must be shared within and across institutions and actors and among the various loci of activity to enable meaningful measurement and use for improvement. The core measures proposed herein require various data sources, including clinical data, claims data, biometric data, and patient-reported data. Each will need to be collected and shared in a standard way to enable standard reporting, comparability, and benchmarking.

Quality and outcome measures are best derived from clinical data, while cost and utilization measures usually are constructed from administrative data. To have a complete picture of value, each type of data must be aggregated and shared with appropriate privacy safeguards, but with the purpose of enabling transparency with respect to performance. Quality measures based on data derived from multiple independent units of interest—such as practices, health plans, hospitals, counties, or health systems—tend to be more valid and reliable than those calculated from a single unit. Within any community, moreover, including data from multiple sources offers a more representative and comprehensive view of health and health care. Purchasers also need a robust multi-payer source of information on health care quality and value in aggregate form to understand total cost of care and to establish benchmarks. For true population health management and reductions in total cost of care, data contributions from a broad spectrum of care and community-based providers, public health and social service agencies, long-term care providers, and others will be necessary to enable measurement of the quality and efficiency of care delivery and health outcomes across settings of care and time.

National data aggregation is useful to heighten attention to quality, identify general areas of variation, develop benchmarks, and inform and stimulate policy. Regional aggregated data are needed to design responses to local priorities, gain the trust of providers and help them take ownership of problems, and target improvement efforts. Programs at the federal or state level aimed at safeguarding the health of children with respect to vaccine-preventable diseases need information on the immunization levels of children and the particular vulnerabilities present at the community, neighborhood, or even institutional level. The importance of this information goes beyond the specific issue of infectious disease prevention because it also tends to reflect the overall integrity of care delivery protocols and safeguards on a variety of important dimensions. Certain reporting requirements and patterns—births, deaths, and reportable diseases—currently are implemented in a relatively common and well-coordinated fashion, but

most of the measures making up the core set presented herein are available only sporadically at various levels and, even then, with spotty consistency and comparability. The core measure set can inform data collection and design of the data set. As an example, to report price and cost requires receipt of all cost elements in claims data. This is necessary not only for the reliability and integrity of the data collected at multiple levels but also for dependable guidance for program implementation and refinement.

Facilitating Informed Patient Choice

Growing awareness that effective care depends on the engagement of patients and families underscores the need for better information on provider performance and on the appropriateness of various clinical services. To date, however, this information has been sparse at best and, more commonly, virtually inaccessible. To address this need for information on clinicians, the Centers for Medicare & Medicaid Services (CMS) is expanding its Physician Compare website to include quality measure data on group practices and accountable care organizations (ACOs) to help patients make informed choices about their health care (CMS, 2014). With respect to informed patient choices about treatment, the American Board of Internal Medicine Foundation developed the Choosing Wisely Campaign to enable conversations between doctors and patients about unnecessary care and, by extension, to identify and reduce the use of services that are commonly delivered for which evidence is lacking. Effective implementation and expansion of such initiatives requires clinician confidence in and public understanding of the reliability, interpretability, and limitations of comparison data—a comfort level. This confidence and understanding can be enhanced through sustained exposure to and familiarity with an ongoing resource of the sort provided by the core measure set. Over time, the core set is intended to carry an element of familiarity and shared ownership of the measurement process to benefit decisions at all levels.

Establishing Targets for Community Efforts

At the broadest level, the core measure set offers the opportunity for national, state, and local leaders to translate into clear and consistent terms the issues that are most important to progress in health at the levels of their focus and responsibilities. By targeting the highest-priority issues for the entire health system, the core measures therefore can serve as a vehicle for promoting community-wide collaboration and investment and the implementation of initiatives aimed at improving performance on the targeted issues. Especially important in this respect is the extent to which the core measure set makes clear the dependence of progress in health on overall

community-wide involvement, and hence on the involvement and mobilization of multiple sectors. Governors, mayors, and other such leaders can use their bully pulpit to recruit, organize, and steward the work of various individuals and organizations on behalf of progress in the target areas of the core measures, and they can use the measures to demonstrate areas of particular priority as well as to demonstrate progress. The core measure set can help streamline, harmonize, and accelerate the mobilization of efforts focused on the important targets. By virtue of the linkages and cooperative planning already enabled by work around issues in the core measure set, a local health officer will have established the ongoing relationships necessary for cooperative community action—for example, against the appearance of a newly emerging infectious disease such as severe acute respiratory syndrome (SARS) or Ebola. Building familiarity and cooperation through work around the core measure set will improve overall system readiness. Critical to realizing opportunities at the community level is coordination and collaboration among a broad group of stakeholders in a community, including public- and private-sector groups, employers, community health organizations, public health agencies, and more.

USE IN ASSISTING AND ASSESSING LARGE SOCIETIAL INITIATIVES

In addition to the practical applications described above, the core measure set is of central utility in drawing attention to, illustrating, and tracking progress on large, cross-cutting initiatives of social importance. Examples currently under way include those devoted to achieving greater health equity, accelerating progress toward what the Institute for Healthcare Improvement (IHI) has termed the Triple Aim®, implementing the National Prevention Strategy and the National Quality Strategy, and achieving the affordable care agenda inherent in the Patient Protection and Affordable Care Act (ACA).

Health Equity

Disparities in health prospects and outcomes represent a significant national challenge, in particular when those disparities are related to economical, social, or environmental disadvantage and represent matters of health equity (HHS, 2011). Individuals from minority racial and ethnic backgrounds experience a higher incidence and severity of certain diseases and health conditions relative to white individuals (APHA, 2013). For instance, one study found that the rate of hospitalization for uncontrolled diabetes without complications was almost 5 times higher in African Americans and 3.6 times higher in Hispanics than in non-Hispanic Caucasian

patients (Russo et al., 2006). Moreover, in 2011, African Americans made up 12 percent of the U.S. population but accounted for 42 percent of all Americans living with HIV/AIDS (Perkins et al., 2013). A similar disparity is seen in self-reported outcomes. While 70.5 percent of non-Hispanic white persons reported excellent or very good health in 2013, this was the case for 60.1 percent of non-Hispanic African American persons and 57.7 percent of Hispanic persons (CDC, 2013). Socioeconomic challenges also present barriers to accessing health resources and services (CDC, 2010). According to the Medical Expenditure Panel Survey, 7 percent of high-income individuals experienced difficulty in receiving care as compared with 15 percent of people living below the federal poverty level (AHRQ, 2012). Children living in families with incomes below the federal poverty level also had lower vaccine coverage than did children living in families at or above the poverty level (CDC, 2012). Disparities in the quality of care may be seen as well, as suggested by the observation that racial minorities experience more avoidable procedures, avoidable hospitalizations, and untreated disease relative to white individuals (Fiscella et al., 2000). Because of the persistence of disparities throughout the nation, the U.S. Department of Health and Human Services (HHS) has charged the Agency for Healthcare Research and Quality with the annual development of a National Healthcare Disparities Report. With consistent application of the core measure set at multiple levels, this report could provide a much more robust sense of the opportunities of particular importance and promise.

IHI Triple Aim®

The core measure set proposed by the Committee can be used to help track and promote progress toward the Triple Aim. This term originated with IHI in 2007 and is widely used to characterize the critical goals of health and health care: improving the patient experience of care (including quality and satisfaction), improving the health of populations, and reducing the per capita cost of health care. The Triple Aim terminology maps well to the domains of influence—healthy people, quality of care, costs of care, and people’s engagement in health and health care—utilized by the Committee in identifying areas for action and corresponding core measures designed to achieve better health at lower cost (see Figure 5-1).

Similarly, and in a variation on the theme, the U.S. Department of Defense (DOD) has adapted the IHI’s Triple Aim concept to its own priorities. Because such important elements of the responsibilities of the Military Health System (MHS) revolve around preparedness and the ability to mobilize a rapid response to unexpected circumstances, the MHS in 2011 developed the Quadruple Aim for military personnel, which adds to the Triple Aim a fourth dimension—readiness, defined as “enabling a medically ready

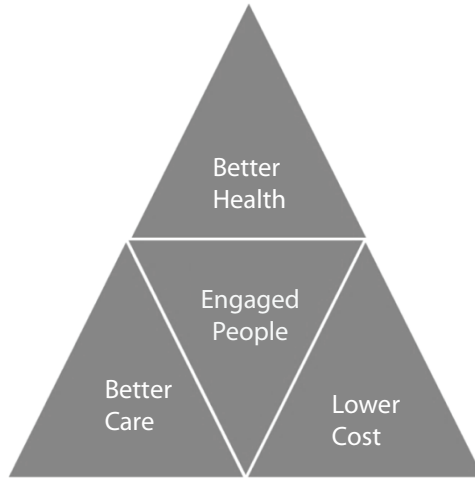


FIGURE 5-1 Key health domains.

force, a ready medical force, and resiliency of all MHS personnel” (MHS, 2010). For either the Triple Aim or the four-part aim, a core measure set that affords regular and reliable access to information at multiple levels on the factors most important to improving health outcomes is a necessary tool for effective action. The fundamental difference of these approaches to articulating aims is that the health care system’s purpose is to enable citizens to fully engage in the activities of their daily lives, not readiness to engage with the health care delivery system. This requires different prioritization of resources to enable health—not treat disease—and different roles and relationships among health care and community-based organizations.

Six Quality Aims

The landmark Institute of Medicine (IOM) report *Crossing the Quality Chasm*, defined the six aims for quality as care that is safe, effective, patient-centered, timely, efficient, and equitable. The IOM definition of quality is reflective of the Committee’s intent and was an important starting point in the Committee’s deliberations about quality of care measures. However, the six-item care definition was not specifically mapped onto the core set, as the Committee wanted to achieve a more parsimonious approach than the IOM definition allowed. Safe, effective, patient-centered, and timely are each explicitly included in the quality care core measures (patient safety, evidence-based care, care match with patient goals, and care access). Equity was not included within the quality domain, as the

Committee concluded that its importance required its embedding throughout—including in healthy people, cost, and engagement as well. In the realm of efficiency, the Committee concluded that the highest priority issue was the cost of care, which was indicated as a separate domain in the statement of task. In this way, the spirit of the six aims for quality was foundational to the Committee's articulation of the core measure set, and the Committee's definition of quality was the same, though the final framework of the set around the four aims described in the statement of task required an alternative approach to presentation.

National Prevention Strategy

In 2011, HHS released the National Prevention Strategy, establishing the goal of increasing the number of Americans who are healthy at every stage of life and underscoring the vision of a nation focused on prevention and wellness. The National Prevention Strategy outlines strategic directions oriented toward healthy and safe community environments, clinical and community preventive services, empowered people, and elimination of health disparities. In so doing, it in effect lays out an approach to achieving the national goals and objectives of *Healthy People 2020*, which identify what the nation ought to achieve by 2020 if attention and action can be mobilized. Accomplishment of these goals and objectives successful implementation of the anticipated strategies will address some of the most difficult health challenges faced by the nation, with seven specified priorities: tobacco-free living, preventing drug abuse and excessive alcohol use, healthy eating, active living, injury- and violence-free living, reproductive and sexual health, and mental and emotional well-being. Although the core measures identified by the Committee reflect parsimony, progress against these priorities will depend on the multilevel information that can be generated through implementation of the core measures.

National Quality Strategy

Also in 2011, HHS released the National Quality Strategy, established with the aim of providing better-quality, more affordable care for individuals and communities. Development of the National Quality Strategy, which was mandated by the ACA, was led by the Agency for Healthcare Research and Quality. It focuses on six priority areas: making care safer, ensuring the engagement of all individuals and families in their care, improving care communication and coordination, promoting effective prevention and treatment for the leading causes of death, advancing best community practices for healthy living, and making quality care more affordable. Also identified are nine levers that can be used by stakeholders to implement the strategy.

A central element of the strategy is aimed at aligning clinical measures. Accordingly, the HHS Measurement Policy Council was convened to begin aligning measures across HHS—for example, for hypertension control, hospital-acquired conditions, patient safety, smoking cessation, patient satisfaction, obesity, depression screening, and care coordination. With its focus on systematic, systemic, and continuously improving assessment of such issues as evidence-based care, care match with patient goals, spending burden, and individual and community engagement, the core measure set proposed by the Committee will provide critical multilevel insight and guidance for progress on the National Quality Strategy.

Affordable Care Agenda

Despite the long-standing and mounting concern about the personal and national impact of health care costs, the rate of increase in those costs continues to outpace cost and price increases throughout the rest of the economy. Further, evidence suggests that costs of care vary widely among geographic areas and institutions, without corresponding variation in quality of care. The ACA contains provisions aimed at improving transparency in health care costs and providing incentives for their containment, including provisions related to ACOs. Progress is unlikely to achieve its potential until better information is available in a comparable fashion from the places where payments are designed and care is delivered. Additional insight is needed into pricing and resource utilization and their relative contribution to the total cost of care. Implementation of the core measures system-wide will provide insight on the personal burden of health care expenditures and, in a unique fashion, will facilitate more granular perspectives on how places vary in their resource use according to population and population purchasing power, reflecting the implications of these factors more precisely.

USE IN LEVERAGING EXISTING PROGRAMS AND REQUIREMENTS

Because core measures are not intended to replace the full landscape of health measurement, the extent to which they complement and enhance various existing activities is an important consideration for their design and application. This section describes how the core measures can be used to enhance the effectiveness and efficiency of several priority programs with measure reporting requirements, addressing, in turn, electronic health records (Meaningful Use), accountable care, health care payers and purchasers, state Medicaid waivers, categorical health grants, community health planning, and community benefit programs (see Table 5-1).

TABLE 5-1 Applications of the Core Measure Set for Existing Programs/Requirements

Activity	Utility of Core Measures
Meaningful Use Program	Provide standardized elements for every electronic health record, contributing reliability and comparability to information on health and health system performance and advancing the goal of Meaningful Use.
Accountable care	Facilitate comparability in the application of the 33 accountable care organization (ACO) measures, and provide an important tool for gauging the extent to which an ACO is delivering on the intended care, cost, and population health outcomes.
Payers and purchasers	Provide a stronger, more sustained focus on outcomes and costs with standardized tools for assessing the performance of health care organizations and clinician performance and results for covered populations.
State Medicaid waivers	Streamline and standardize the assessment and comparison of performance in improving core health outcomes under different circumstances and forms of waiver authority and across states, counties, facilities, and time.
Categorical health grants	Enhance comparisons across sites and time; help identify best practices across programs, communities, and states; and facilitate look-back studies aimed at identifying post-grant results on certain important outcome dimensions.
Community health planning	Provide well-timed assessment of progress and changing needs for attention and resources, especially important to meeting growing responsibilities of health systems for population health improvement.
Community benefit requirements	Focus community benefit initiatives on issues most important to outcomes, and improve prospects for targeted coordination of efforts involving multiple organizations.
Related health care reform provisions	Increase the quality and transparency to consumers of health, health care, and cost information to assist in their health and health care choices.

Meaningful Use

The federal government's Meaningful Use Program, administered by CMS in coordination with the Office of the National Coordinator for Health Information Technology, provides incentives for providers—hospitals and health professionals—to maximize the potential benefits of electronic health records. In this program, benchmarks have been set for providers to use in showing progressive capability in the use of electronic health records through three program stages. The embedded objectives relate to a range of clinical priorities—health outcomes, clinical processes, patient safety, care coordination, patient engagement, population and public health, and use of clinical guidelines—as well as to data and definition standardization and sharing capacity. Incorporation of the core measure set as a basic Meaningful Use feature would provide standardized elements for all electronic health records, contributing reliability and comparability to information on health and health system performance, increasing the prospects for seamless interoperability in the records' sharing and use, and accelerating advancement toward the program's basic clinical priorities. Full application will require a practical means of introducing population health elements.

Accountable Care

Increasing awareness of the occurrence of medical errors, along with concerns about unwarranted and unsustainable costs, has prompted a stronger focus on accountability in health care. To provide incentives for care models that can achieve improved outcomes while controlling costs, the ACA contains several provisions designed to stimulate the development of ACOs and increase emphasis on care coordination and management and on prevention (McClellan et al., 2014).

The several hundred ACOs now in operation are diverse organizations. Because, through programs such as the Medicare Shared Savings Program and the Pioneer ACO Model Program, CMS has been a major driver in the development of ACOs, the agency has developed 33 measures for use in assessing their performance. Those measures are intended to facilitate the internal planning and operations of ACOs, as well as to assist CMS and other stakeholders in evaluating the quality and success of different facilities, different programs, and different approaches. Those 33 measures include several that target patient and caregiver experience, care coordination and patient safety, preventive health, and management of patients at high risk for certain diseases. The core measure set proposed by the Committee will facilitate comparability in the application of the ACO measures and

provide a needed tool for gauging the extent to which an ACO is delivering on the care and population health outcomes intended.

Health Care Payers and Purchasers

Approximately four dozen sizable health insurance companies, plus Medicare, currently operate in the United States, each traditionally collecting data in various ways that are substantially uncoordinated, unavailable for the generation of new knowledge, and certainly unstandardized. With progress toward expanded access to health insurance via health exchanges formed by states and the federal government, and with increasing demands for transparency of information on cost and quality in the health care system, the potential is developing to draw on substantially expanded databases for new insights into the effectiveness and efficiency of care. Still, the many technical, market, and regulatory barriers to progress will hinder the ability to put the data to the best uses possible. Application of the core measure set across all payers as commonly collected data points can serve as a valuable tool for assessing basic important outcomes across providers, plans, and circumstances. Further, use of the core measure set can enable employers and health plans to better assess and understand the characteristics and needs of their populations and, by extension, to develop priorities and tailored interventions for achieving better health at lower cost. Progress toward this enhanced availability and use of data is illustrated by state and regional all-payer claims databases, which are used in states and regions to aggregate claims data for measurement and reporting. This includes the 13 Qualified Entities designated by CMS to receive identified Medicare data for the purpose of public reporting on provider performance. This federal designation creates a framework for transparency through the use of Medicare data by regional entities that have demonstrated an ability to aggregate and use commercial claims data for measurement and reporting, a framework that can be expanded.

State Medicaid Waivers

Medicaid covers nearly 70 million people in the United States and finances about 16 percent of all health care expenditures. With about one of five state dollars going to Medicaid expenditures—ranking behind only education as the largest state expenditure—Medicaid growth is of major interest and concern to states across the country. Especially with Medicaid programs expanding under the ACA and serving some of the highest-risk, most medically complex populations, states are seeking waivers from HHS to allow them greater flexibility in tailoring program expenditures to their needs and opportunities. There are currently four types of waivers

available to states for testing tailored, sometimes novel approaches to the payment and delivery of services in Medicaid and the Children's Health Insurance Program: Section 1115 research and demonstration projects for approaches to structuring payments; Section 1915(b) projects for providing services through managed care systems; Section 1915(c) waivers for providing home- and community-based (rather than institutional) services, and concurrent (b) and (c) waivers emphasizing service continuity for the elderly or disabled. Because the waiver programs are aimed at identifying ways of improving outcomes while lowering costs, and because there is great heterogeneity across programs, assessing their results in a reliable and comparable fashion across states is very difficult, particularly when so many of the measures employed focus on process performance. Orienting accountability reporting around a standardized set of core measures can facilitate assessment of performance on core outcomes and provide for the meaningful ability to compare results across states, counties, facilities, and time under different circumstances and forms of waivers.

Categorical Health Grants

With programs targeting various health priorities—from preventive services such as immunization, high blood pressure control, and cancer screening to treatment services for those with HIV/AIDS, alcohol and drug abuse, and kidney disease—in the range of 200 categorical health grant programs are administered by various agencies within HHS. Each of these grants has data collection and reporting requirements, and apart from data that are highly specific to the targeted condition, many of these requirements are aimed at gathering similar information but from different perspectives, and not in a standardized fashion. The heterogeneity of measures in use by these types of programs limits comparability and meaningful assessment, as it may be difficult to conclude that a project is successful without the ability to compare both across time and among different facilities, regions, or programs. The measures selected often target care processes rather than outcomes that may result directly or indirectly from the services made available through the grant. In addition, outcomes specific to the grant's targeted condition may not materialize until sometime after the grant has ended, rendering knowledge about life expectancy, well-being, or other possible outcomes of clear importance to the patient inaccessible. Ensuring that all categorical grant programs are generating standardized data points around the core measure set not only can facilitate assessment of various outcomes across time and sites but also may allow look-back assessments for results occurring after a grant's conclusion.

Community Health Planning and Community Benefit Requirements

Community health planning depends on the capacity to assess health status and needs routinely and reliably across demographic and geographic clusters. Moreover, coordination and comparable assessment strategies are needed among the various public and private stakeholders involved in the activity. These needs take on new urgency with increasing recognition of the need for community-based strategies for population health improvement as a core responsibility of the health care system. By focusing collective attention on the highest-priority issues for the health system as a whole, core measures have the potential to promote collaboration and adoption of a shared agenda, as well as to serve as a tool that enables participants to see progress and identify challenges earlier in the course. Economic incentives are now in play as well. The ACA requires health care institutions that are tax-exempt—about 60 percent of U.S. hospitals are nonprofit—to invest in community health assessments and community benefit activities that address critical community needs. This parallels the 5-year time frame for public health departments' Community Health Needs Assessment, creating a potential opportunity for harmonization. The core measure set provides an essential tool for all institutions in a community seeking a reliable and sustained source of insight on gaps and progress, and depending on how the U.S. Department of the Treasury provides guidance and structures its approval processes, the set could serve as a means of fostering community collaboration among multiple institutions.

IMPLEMENTATION CHALLENGES FOR STAKEHOLDERS AT MULTIPLE LEVELS

The development, adoption, implementation, maintenance, and continuous improvement of the core measure set will face many challenges at every stage—challenges that require explicit acknowledgment and aggressive cooperative engagement on the part of the entire stakeholder community if the full potential of the core measures is to be achieved. These challenges include limitations of the existing measurement infrastructure, variability in the approaches to measurement taken by different actors, the need for financial and personnel investments, legal and regulatory barriers, the need to assess relevance to multiple circumstances and stakeholders, and issues of trust and attribution.

Existing Measurement Infrastructure

Since a combination of data from patient claims, clinical experience, patient reports, regular surveys, and public health sources is required to

produce the core measures in a standardized, consistent, reliable, and sustained fashion, it is necessary to have a measurement infrastructure that is multifaceted, with seamless interfaces among components. The small size of the core measure set enhances its feasibility, but its implementation will require deliberate strategy and strong leadership. Implementing the core measures will require infrastructure that can consistently capture the key data elements needed to populate the measures and can exchange those data elements across populations and data systems. Although progress is being made toward this goal, there remains a significant gap between the current reality of data availability and collection and what is needed to support a nationwide core measures set.

At present, data are rarely available across provider organizations, payers, or patient populations because of restrictions on data sharing and proprietary interests. The current fragmentation will not meet the needs of individuals or organizations, nor will it support the capacity for regular assessment across the full landscape of organizations and individuals involved in the health system. Despite an investment of significant resources, there remains a patchwork of independent claims data and electronic health record systems that fail to capture key data elements in consistent formats and cannot readily exchange those elements across systems. To develop a core measurement environment that encompasses the full breadth of the health system and provides high-quality, useful data, significant advances and improvements in digital infrastructure and analytic capacity will be necessary. The need for infrastructure development is particularly acute in health venues such as long-term care facilities and rehabilitation centers, which fall outside of traditional hospitals and health systems. Encouraging the development of infrastructure capacity in these venues will be a key challenge for the development of measures that meaningfully reflect the health system as a whole.

Variable Approaches to Measurement

It is critical that the data source for each core measure be valid, reliable, and standardized. Each data source has its challenges, however, and combined data sources currently are not widely available, limiting comparability. Yet the data used to populate measures must be both available and comparable, as data variations may incorrectly suggest variation in performance. Exclusion of behavioral health claims from insurers in one region, for example, would have a significant impact on total cost measurement and results. Obtaining a complete view of total cost requires access to the data needed to fully populate the measure set, and making a fair comparison across regions requires a consistent and standard approach to the inclusion of data elements.

Patient-reported data, typically gathered through periodic surveys, require a large number of surveys for an adequate sample size, a requirement that imposes considerable expense and administrative burden. Capturing data electronically may reduce the cost of surveying, but with the added risk of skewing the sample toward patients with access to and comfort with computers or other technology. Clinical data offer an optimal source of data for quality measurement but are difficult to obtain in an aggregated format. Current health information technology and electronic health records rarely enable interoperability, so that clinical data cannot always be shared or integrated across settings or over time. Moreover, access is limited by privacy and other concerns and assertions of ownership by individual organizations.

Claims data are the most readily available data, but health plans often place restrictions on data sharing and disclosure of data elements, making it difficult to access the data for community-wide or multipayer measurement initiatives. Several states have mandated the submission of claims data to all-payer claims databases to enhance access, and several regional health improvement collaboratives have gained voluntary support for data sharing, enabling system-wide and longitudinal measurement and reporting. Data that are effectively organized can both identify opportunities to reduce spending and support the development of payment reforms, enabling providers to capitalize on those opportunities.

An additional problem involves the use of individual versus pooled data by payers and providers, respectively. Typically, each physician and hospital receives information separately from each payer, resulting in an inherent decline in the quality of the data as the number of patients in any category will be smaller. Payers, on the other hand, typically pool their data, resulting in potentially higher reliability, but they use different definitions of the categories, different risk adjustment systems, and different comparison groups.

The more payers are generating these different reports, the more difficult it will be for health care providers to find the time to review and act on this information. Some national entities now are aggregating claims data from different payers, and several states have mandated submission of claims to all-payer claims databases to enable more comprehensive measurement. A growing number of communities have multi-stakeholder Regional Health Improvement Collaborative (RHIC) organizations that can combine claims data from all or most of the payers in the community and are capable of generating more robust analyses of spending, as well as payer-specific analyses in a common format. These emerging data sources will provide important resources for the use of a set of core measures, yet many barriers to consistent and comprehensive access to the data remain.

Need for Financial and Personnel Investments

Data collection, aggregation, and management can be expensive and currently are not reimbursed. Given the specification, standardization, and analysis required, implementing new measures will require near-term financial and personnel investments. Resources will be required to configure data systems to capture the key data elements needed for the core measures. Additional resources will be necessary for clinical staff who must collect the data and enter them into the electronic health records, and further resources will be needed to update the data systems as measure specifications change over time. It will be important to consider these demands, as the feasibility of implementing the measure set will depend on the feasibility of implementing each component measure. Additionally, resources will be required to analyze the measures and apply that information toward improving health and health care. A transition period will be required to develop the skills and the technology needed to support the new measures. With performance measures typically being specified in multiyear contracts and tied to incentive payments, the transition will take time. On the other hand, the medium- and long-term savings can be substantial. The alignment and use of common measures not only can relieve provider burden but also reduce the waste of resources on redundant programs and accelerate improvement. Agreement by public and private purchasers on the use of the core measures for purchasing and accountability programs will streamline the effectiveness and efficiency of those efforts. As the return on investment for the use of core measures will not be immediate, realism is warranted as to time frames for implementation.

Legal and Regulatory Barriers

The process of standardizing data and improving sharing and access for widespread use requires engaging various legal and regulatory issues. As implementation of a core measure set includes the alignment of core measures with existing standards and regulations, the regulations may have to be changed to provide a common method for data definition and collection across the health system. Standards-setting organizations are therefore important partners in implementation of the core measures. Their standards can support a common measure set by ensuring that the necessary data elements are collected or by directly requiring their collection. In addition, various policies governing the collection, reporting, and use of health information must be engaged in the widespread application of a core measure set. One particularly important issue centers on privacy protections under the Health Insurance Portability and Accountability Act (HIPAA). Even though the constraints these protections place on data sharing may

be more a function of perception of the requirements than their content, the uncertainty involved contributes to variability in performance, and the assurance of data safeguards, where appropriate, will be important to the broad application and use of a core measure set. The penalties associated with data breaches may also contribute by encouraging conservative behavior by health care organizations.

Need to Assess Relevance to Multiple Circumstances and Stakeholders

As discussed previously, core measures present a relatively high-level view of health issues and outcomes, and therefore the measures included may not be equally relevant to all circumstances and stakeholder groups. Given the salience of the issues represented in the core measures, most health professionals will recognize the centrality of the measures to achieving their key goals and priorities. A specialist in allergy and immunology, for example, may not immediately find relevance in a core measure set that does not link explicitly to that specialty. On the other hand, progress in that arena is clearly dependent on widespread attention to such issues as well-being, community health, use of evidence-based practices, care match with patient goals, and individual and community engagement. Nonetheless, translation and emphasis will be important for the core measures to be recognized as vital elements in progress in all of health and health care.

In many cases, core measures may need to be translated for utility at different levels of aggregation. For example, while proportion of gross domestic product devoted to care provides a national view of health care spending, the concept of population spending burden also can be represented at the state, local, and institutional levels. At the state or local level, health care spending burden can be compared against overall budgets or economic output, or spending levels can be assessed relative to those in peer states or to a performance benchmark. At the level of health care institutions, the HealthPartners total cost of care and resource use measure can provide actionable information on spending in the context of providing care services.

Issues of Trust and Attribution

The foundation of all successful implementation efforts is a strong sense of trust in the goals and potential benefits of the project or program. The core measures are intended to bring both local benefits to individual stakeholders and generalizable benefits to the health system at large. Making the case for adopting the core measures requires an approach that emphasizes confidence in these anticipated benefits and the expectation that they will outweigh any potential costs or challenges. Repeated, consistent

messaging in this regard will be key to building trust. An additional issue to be anticipated is the management of attribution—that is, the extent to which people or groups will be held accountable for any perceived successes or failures illustrated by the data resulting from application of the core measures. Health represents a complex measurement challenge; many factors contribute to measurement results, some of which may be beyond the health system’s direct control. For example, a hospital serving a low-income population would likely have lower scores on health outcome measures than would a hospital serving a relatively affluent population, although this differential may not reflect a disparity in the quality of care provided. The success of core measures and the interpretation of the data they produce will depend on a shared accountability view, such that results reflect on the system as a whole.

CONTINUOUS IMPROVEMENT

The success of the core measure set in driving progress throughout health and health care will depend not only on overcoming the challenges discussed above but also on strong and sustained leadership in continuous improvement of the set and each measure within it. Because many of the measures in the core set are limited to best current measures until more representative standardized alternatives are developed, that process needs to begin immediately. The process will need to involve multiple stakeholders in cooperative work, which in turn will require the necessary leadership capacities for governance, networking, and dissemination; measure standardization; technical assistance; evaluation of success; updating and retiring measures; and updating and amending the core measure set.

Leadership

The Committee believes that the Secretary of HHS is the appropriate official to take on the leadership and governance roles required for successful stewardship of the core measures and their implementation and continuous improvement. It is the Secretary of HHS who directs the agencies most involved in the collection and use of health data; who signs off on reporting requirements and responsibilities; who is centrally positioned to convene and work with the key stakeholders; and who, as the leader most responsible for the nation’s effectiveness and efficiency in delivering better health at lower cost, has the greatest potential to ensure that the capabilities of the core measure set are realized. A schematic presented as Figure 5-2 identifies some of the primary needs and opportunities in that respect, including immediate introduction and use in federal programs and those of other stakeholders, as a pilot phase to gather information;

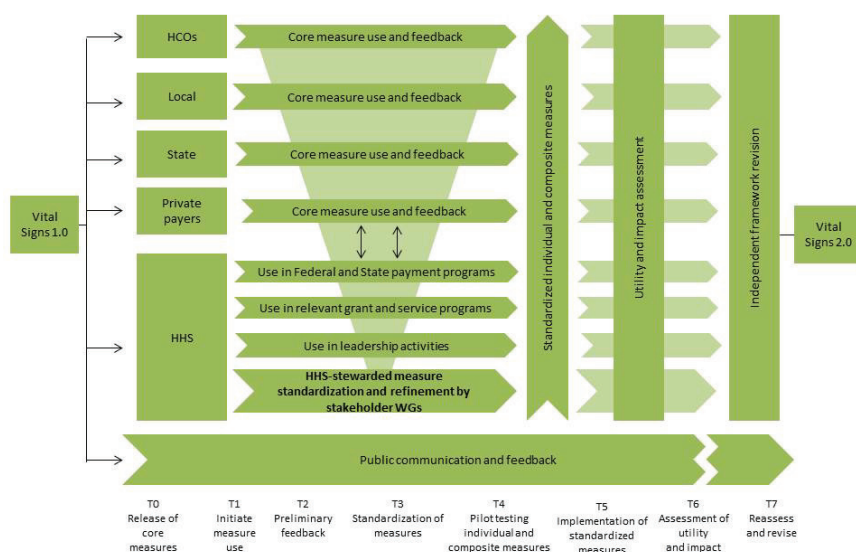


FIGURE 5-2 Schematic for HHS implementation of vital signs.

NOTE: HCO = health care organization; HHS = U.S. Department of Health and Human Services; WG = work groups.

development of a series of stakeholder working groups for each of the 15 measures, stewarded by HHS and charged with standardization and development of composites; then pilot testing and beginning the cycle of continuous improvement.

A first-order leadership opportunity lies in the Secretary's ability to embed the use of the core measure set in the programs administered within HHS, as well as to help overcome the obstacles inherent in the many entities with vested interests in maintaining the varied measures and measure sets that suit their particular programs and priorities. Some entities design measurement and reporting products as part of their business model for a specific audience; some prefer particular measures for their internal improvement efforts; and product developers may prefer unique measure sets for market differentiation. As noted above, however, standardization, introduction, and use of the core measures as key components of and reference points for Meaningful Use, accountable care, the Medicaid waiver program, and even categorical health grant programs will contribute substantially

to system-wide capacity while also improving the productivity of the individual programs. In addition, leadership at the level of the HHS Secretary will be required to overcome the challenges described above that limit the alignment and application of the measures.

Measure Standardization

Standardization of the core measures is essential to enable greater awareness and understanding of the most critical issues facing the nation's health system. The development, validation, and adoption of standardized measures will require the involvement of multiple stakeholders and experts in the issues addressed by the measures. A second key role requiring the active involvement and wielding of levers uniquely available to the Secretary of HHS, therefore, is engaging three early-stage measure application and refinement efforts, tailored to the demands of an evolving process: (1) developing guidance for the field on approaches to using best current measures in a fashion that will best advance the intent of the core set; (2) setting in motion the activities necessary to standardize the best current measures; and (3) planning and carrying out the process by which multi-stakeholder working groups will consider and develop the horizon measures for each of the core measure foci and determine how they will be implemented. Strong leadership will be needed to meet the formidable challenge of standardization. (Table 5-2 lists potential horizon measures for the core measure foci and example participants in their development.) To produce standardized and comparable measures of cost and value will likely require aggregation of claims data from multiple payers. Standardization of the data received from payers will, in turn, require attention to the data specifications, including such issues as the use of common definitions and the completeness of fields. Data currently are collected differently across programs, payers, and regions based on state policy, contracts, and privacy restrictions on certain data elements. But if communities seek to compare total cost and resource use across regions, for example, each data set will need to include and exclude the same elements—for instance, include substance use and behavioral health treatment data or exclude certain categories of outlier-cost patients—to avoid distortions in the results. Improved technical capabilities and the widespread availability of health information technology will be needed to enable the broad availability of integrated data sets. Resources, both human and financial, will be required to develop and maintain accurate methods for understanding provider relationships with patients, practices, and systems to enable attributed measurement and reporting.

TABLE 5-2 Example Horizon Indicators and Measure Development Participants

Core Measure	Possible Horizon Indicators	Example Participants in Measure Development ^a
Life expectancy	Years of healthy life lost before age 80	<ul style="list-style-type: none"> • Health Care Incentives Improvement Institute • National Committee for Quality Assurance • Network for Regional Health Improvement
Well-being	Physical, mental, emotional, and social well-being (composite index)	<ul style="list-style-type: none"> • National Quality Forum • Patient-Centered Outcomes Research Institute • Trust for America's Health
Overweight and obesity	Years of healthy life lost due to overweight and obesity	<ul style="list-style-type: none"> • America's Health Insurance Plans • Association of State and Territorial Health Officials • National Association of County and City Health Officials
Addictive behavior	Health and social impact of all addictive behaviors (composite index)	<ul style="list-style-type: none"> • National Association of Community Health Centers • National Council on Alcoholism and Drug Dependence • Trust for America's Health
Unintended pregnancy	Unintended pregnancy rate	<ul style="list-style-type: none"> • The Child and Adolescent Health Measurement Initiative • Guttmacher Institute • National Partnership for Women and Families
Healthy communities	Environmental quality, green space, socioeconomic status, social capital (composite index)	<ul style="list-style-type: none"> • Institute for People, Places and Possibility • Minnesota Community Measurement • National Association of Community Health Centers • Network for Regional Healthcare Improvement • Robert Wood Johnson Foundation • Trust for America's Health
Preventive services	Proportion of people receiving the full range of the U.S. Preventive Services Task Force's recommended preventive services	<ul style="list-style-type: none"> • National Association of County and City Health Officials • National Business Group on Health • Prevention Institute

TABLE 5-2 Continued

Core Measure	Possible Horizon Indicators	Example Participants in Measure Development ^a
Care access	People reporting barriers to care	<ul style="list-style-type: none"> • The Commonwealth Fund • National Association of Community Health Centers • National Committee for Quality Assurance • National Quality Forum
Patient safety	Patient safety events (composite index)	<ul style="list-style-type: none"> • <i>Consumer Reports</i> • Joint Commission • National Patient Safety Foundation
Evidence-based care	Proportion of care that is based on evidence (composite index)	<ul style="list-style-type: none"> • American Medical Association • American Nurses Association • National Committee for Quality Assurance • National Quality Forum
Care match with patient goals	Patients reporting goal discussion and follow-up	<ul style="list-style-type: none"> • <i>Consumer Reports</i> • Institute for Patient- and Family-Centered Care • Patient-Centered Outcomes Research Institute • Society of Participatory Medicine
Personal spending burden	Out-of-pocket health spending as share of income	<ul style="list-style-type: none"> • The Commonwealth Fund • Health Care Cost Institute • Health Care Incentives Improvement Institute
Population spending burden	Total spending as a share of income or revenue in a specific population	<ul style="list-style-type: none"> • Health Care Cost Institute • Health Care Incentives Improvement Institute • National Business Group on Health
Individual engagement	Involvement in self-care, family health, and community health (composite index)	<ul style="list-style-type: none"> • Consumers Union • Institute for Patient- and Family-Centered Care • Patient-Centered Outcomes Research Institute
Community engagement	Community focus/progress on health improvement (composite index)	<ul style="list-style-type: none"> • Consumers Union • Institute for Patient- and Family-Centered Care • National Association of Community Health Centers

^a Those listed are illustrative examples only from a large pool that also includes the various federal agencies with health measurement expertise and activities, as well as a commitment to ensuring the active participation of personal and professional stakeholders.

Technical Assistance

A third tool available to the Secretary of HHS for ensuring attainment of the potential of the core measure set is providing technical assistance to those working at other levels to assess how the core measures can best be incorporated into their institutional operations and work flows, the steps involved in aligning the capture of data to meet the needs of standardization, and the best ways to interface with other activities to maximize the utility of this work. With a ready regional capacity, as well as program leaders well established throughout the nation, the Secretary of HHS is well equipped to provide such technical assistance and the coordination that will be crucial to nationwide implementation of the core measure set.

Evaluating Success

If core measures are to lead to positive change, the performance measurement enterprise must both be part of a local system for change represented by a community health management system and capable of demonstrating contributions to accelerated progress toward better health at lower costs. At the community level, for example, several cities—such as Aurora, Colorado; Camden, New Jersey; and Kansas City, Missouri—have formed coalitions representing a comprehensive approach to health that have applied geocoding and other measurement strategies to design and implement population health initiatives. For instance, Kansas City targeted areas of the city where chronic health conditions, preventable infections, poverty, poor housing, and “food deserts” are concentrated. The city’s “bring health reform home” initiative includes strategies for addressing these socioeconomic inequities and improving access to care as well as economic security, including a recommendation to increase the minimum wage. At the state level, Oregon’s 16 regionally based community care organizations (CCOs) provide an example of an integrated health care and community health management system supported by an improvement and learning system. Each CCO is governed by a coalition of health care providers, consumers, local partners, and those organizations at financial risk.

Updating and Retiring Measures

Continuous learning requires adaptation as circumstances and opportunities change. Recent payment reforms are aimed at moving from a fee-for-service system that requires accounting-based measurement of individual services to a performance-based payment system emphasizing

value in health care. This shift offers a unique opportunity to test the ability of the core measure set to capture the utility of an outcome-based measurement approach that can reduce the amount and granularity of data collected—particularly claims data—by assessing care at the diagnosis, provider, or population level rather than at the level of individual services rendered. Although some process-related measurement will continue to be necessary for evaluation of organizational, group-specific practices, process measures will be eclipsed by core measures that more directly reflect health prospects. As the current administrative burden is alleviated by the transition from process- to outcome-based measurement, ongoing evaluation of the measures being employed at all levels of health care will be required.

Beyond the content of measures, systems will be needed to enable their improvement as underlying technological capabilities evolve. New technologies, particularly mobile technologies, may augment measurement capabilities and should be incorporated into routine practice as they become viable. For example, emerging new devices can continually measure specific aspects of an individual's physical state, allowing a more complete picture of health status and the impact of various interventions. The expected flow of new data from these personal devices will have implications for what is measurable and actionable. These devices also will pose new challenges, such as their interoperability, the capabilities needed to analyze and use these new data, and the privacy and security of the data.

Updating and Amending the Core Measure Set

Although the best measures for many of the core measure foci have yet to be developed, the Committee believes the measures as a set stand as the vital signs of the nation's health and health prospects. As times change, the content of the core set will need to change accordingly. An approach will therefore have to be developed for periodic reassessment of the content of the set. If the pragmatism of the principle of parsimony is a guide, and the Committee believes it should be, that reassessment process must be carefully designed and managed to guard against pressures to accommodate special causes. Specifically, all analysis, deliberations, and recommendations should be widely inclusive in process but completely independent of any particular stakeholder perspective in product. The often strongly expressed voices of various interests—economic, political, clinical, social, and otherwise—should be heard but should not overly influence outcomes. Care in structuring the eventual approach to updating and amending the core set, at such time as that activity is deemed appropriate, will be vital.

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6

Action Agenda

The nation needs a set of core health and health care measures that also embodies its vision and can be used to gauge its progress. This chapter presents a summary of the Committee's findings, conclusions, and recommendations, along with a brief overview of the conditions important to making a core measure set a reality. Because this process will require broad leadership from stakeholders throughout the nation, the Committee's recommendations are targeted to the various stakeholders' opportunities and responsibilities. Given the interdependence of these opportunities and responsibilities, as well as the health system's complexity, no single sector acting alone can bring about the transformative change needed to align and focus the measurement enterprise. Each sector faces different measurement challenges, has different roles and opportunities, is accountable for different aspects of the system's progress, and depends on critical preconditions for success.

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Based on the findings and conclusions identified throughout the preceding chapters, the Committee recommends the rapid and effective adoption and implementation of the core measures for better health at lower cost identified in this report (see Figure 6-1). It further recommends the specific actions for different groups summarized in Box 6-1 and detailed in the subsections that follow.

	Life expectancy
	Well-being
	Overweight and obesity
	Addictive behavior
	Unintended pregnancy
	Healthy communities
	Preventive services
	Care access
	Patient safety
	Evidence-based care
	Care match with patient goals
	Personal spending burden
	Population spending burden
	Individual engagement
	Community engagement

FIGURE 6-1 The core measure set.

The Nation

Findings: The complexity of health and health care—causally, clinically, therapeutically, and organizationally—presents myriad challenges to health improvement strategies, as well to the measurement of progress. The result is a sometimes confusing and burdensome array of measures that focus on processes of care and diffuse measurement efforts. Although health and health care pose distinctive requirements, the challenge of simplifying and targeting measures has been faced successfully in other sectors through standardized reporting on a relatively few issues.

Conclusions: A parsimonious and standardized set of core measures aimed substantially at outcomes could improve the ability of both decision makers and the public to direct their attention and understanding to the most important issues in health and health care. Several such issues—for example, the influence of behavioral, social, and environmental factors—will require particular attention in the refinement and application of measurement tools.

BOX 6-1

Committee's Recommendations

The Nation

Recommendation 1: The parsimonious set of measures identified by the Committee should be widely adopted for assessing the state of America's health and health care and the nation's progress toward the goal of better health at lower cost.

All People—as Individuals, Family Members, Neighbors, Citizens, and Leaders

Recommendation 2: All people should work to understand and use the core measure set to assist in taking an active role in shaping their own health prospects and those of their families, their communities, and the nation.

The Federal Government

Recommendation 3: With the engagement and involvement of the Executive Office of the President, the Secretary of the U.S. Department of Health and Human Services (HHS) should use the core measure set to sharpen the focus and consistency and reduce the number and the burden of measure reporting requirements in the programs administered throughout HHS, as well as throughout the nation.

continued

BOX 6-1 Continued

To this end, the Secretary should incorporate the standardized core measure set into federally administered programs, concomitantly eliminating measures for which the basic practical issues are engaged by the core set:

- HHS's national agenda frameworks for health, including the National Quality Strategy and the National Prevention Agenda;
- the Meaningful Use Program, administered by the Centers for Medicare & Medicaid Services (CMS) and the Office of the National Coordinator (ONC), to ensure that the core measure set becomes a central element of every electronic health record;
- CMS's accountable care organization measurement and reporting requirements;
- CMS's strategies for promoting quality improvement and innovation in health care financing and delivery through the work of the Center for Medicare & Medicaid Innovation;
- federal health care reporting requirements;
- streamlined reporting requirements under state Medicaid waiver authority; and
- categorical health grant program management.

Recommendation 4: With the engagement and involvement of the Executive Office of the President, the Secretary of HHS should develop and implement a strategy for working with other federal and state agencies and national organizations to facilitate the use and application of the core measure set. This strategy should encompass working with

- the Secretary of the U.S. Department of the Treasury on use of the core measure set by tax-exempt hospitals and health systems in demonstrating their community benefit contributions;
- other cabinet departments in administration of their health-related activities—for example, in social services, the environment, housing, education, transportation, nutrition, and parks and recreation;
- state and local governments and voluntary organizations in adapting use of the core measures to their needs and circumstances; and
- multiple stakeholders through the Center for Medicare & Medicaid Innovation in piloting implementation of the core measures through multilevel stakeholder initiatives.

Recommendation 5: The Secretary of HHS should establish and implement a mechanism for involving multiple expert stakeholder organizations in efforts to develop as necessary, maintain, and improve each of the core measures and the core measure set as a whole over time. The Secretary's role should encompass stewardship of work on

- national standardization of the best current measures and related priority measures detailed in this report;
- development of the longer-term indicators necessary to improve the utility and generalizability of the core measures;

BOX 6-1 Continued

- national standardization of reporting on health disparities for each of the core measures, including disparities based on race, ethnicity, gender, and socioeconomic status;
- periodic review and revision of the individual measures in response to changing circumstances; and
- periodic review and revision of the core measure set in response to changing circumstances.

Governors, Mayors, and Health Leaders

Recommendation 6: Governors, mayors, and state and local health leaders should use the core measure set to develop tailored dashboards and drive a focus on outcomes in the programs administered in their jurisdictions, and they should enlist leaders from other sectors in these efforts.

Clinicians and Health Care Delivery Organizations

Recommendation 7: Clinicians and the health care organizations in which they work should routinely assess their contributions to performance on the core measures and identify opportunities to work collaboratively with community and public health stakeholders to realize improvements in population health.

Employers and Other Community Leaders

Recommendation 8: Employers and other community leaders should use the core measures to shape, guide, and assess their incentive programs, their purchasing decisions, and their own health care interventions, including initiatives aimed at achieving transparency in health costs and outcomes and at fostering seamless interfaces between clinical care and supportive community resources.

Payers and Purchasers

Recommendation 9: Payers and purchasers of health care should use the core measures to capture data that can be used for accountability for results that matter most to personal and population health, to refine the analytics involved, and to make databases of the measures available for continuous improvement.

Standards Organizations

Recommendation 10: Measure developers, measure endorers, and accreditors, such as the National Quality Forum (NQF), the National Committee for Quality Assurance (NCQA), and the Joint Commission, should consider how they can orient their work to reinforce the aims and purposes of the core measure set, and they should work with the Secretary of HHS in refining the expression and application of the core measure set nationally.

Recommendation 1: The parsimonious set of measures identified by the Committee should be widely adopted for assessing the state of America's health and health care and the nation's progress toward the goal of better health at lower cost.

All People—as Individuals, Family Members, Neighbors, Citizens, and Leaders

Findings: All people have a strong stake in the issues articulated by the core measure set, and there is growing appreciation of the potential health yield from personal engagement. Yet that potential often goes unrecognized among the many factors in play. A stable, reliable set of key issues to which awareness, attention, and action can be directed is currently lacking.

Conclusions: A core measure set is needed to enable better-informed, more active patient and public leadership for progress in health by providing a common set of reference points and a higher level of transparency on system performance.

Recommendation 2: All people should work to understand and use the core measure set to assist in taking an active role in shaping their own health prospects and those of their families, their communities, and the nation.

The Federal Government

Findings: Many areas of redundancy and overlap in health data and reporting requirements exist within current federal health programs. The result is inefficiencies both internally for the U.S. Department of Health and Human Services (HHS) and externally in its work with providers and other stakeholder groups. In turn, this inefficiency may lead to unnecessary burdens when the collection and management of redundant measures imposes associated costs that outweigh the benefits, as well as to lost opportunities when the data collected are neither working synergistically with those collected in other programs nor directed optimally toward the development of new knowledge.

Conclusions: Use of a core measure set throughout all federal health programs could help better orient those programs while expanding the reach of their contributions. Standardization and coordination are needed among federal health measurement programs to ensure a consistent focus on the outcomes that matter most.

Recommendation 3: With the engagement and involvement of the Executive Office of the President, the Secretary of the U.S. Department

of Health and Human Services (HHS) should use the core measure set to sharpen the focus and consistency and reduce the number and the burden of measure reporting requirements in the programs administered throughout HHS, as well as throughout the nation. To this end, the Secretary should incorporate the standardized core measure set into federally administered programs, concomitantly eliminating measures for which the basic practical issues are engaged by the core set.

- HHS's national agenda frameworks for health, including the National Quality Strategy and the National Prevention Agenda;
- the Meaningful Use Program, administered by the Centers for Medicare & Medicaid Services (CMS) and the Office of the National Coordinator (ONC), to ensure that the core measure set becomes a central element of every electronic health record;
- CMS's accountable care organization measurement and reporting requirements;
- CMS's strategies for promoting quality improvement and innovation in health care financing and delivery through the work of the Center for Medicare & Medicaid Innovation;
- federal health care reporting requirements;
- streamlined reporting requirements under state Medicaid waiver authority; and
- categorical health grant program management.

Findings: Successful implementation of the core measure set will depend on leadership that effectively identifies priorities, thereby motivating action and enabling key stakeholders to work collaboratively. Practical tools that can facilitate focus among multiple stakeholders on the issues that matter most to the health of the nation are currently lacking.

Conclusions: Visible national leadership is needed for the successful adoption and use of core measures that emphasize what matters most. The effectiveness of the core measures in unlocking the benefits of enhanced comparability and reduced measurement burden will depend on how broadly and completely the set is implemented.

Recommendation 4: With the engagement and involvement of the Executive Office of the President, the Secretary of the U.S. Department of Health and Human Services should develop and implement a strategy for working with other federal and state agencies and national organizations to facilitate the use and application of the core measure set. This strategy should encompass working with

- the Secretary of the U.S. Department of the Treasury on use of the core measure set by tax-exempt hospitals and health systems in demonstrating their community benefit contributions;
- other cabinet departments in administration of their health-related activities—for example, in social services, the environment, housing, education, transportation, nutrition, and parks and recreation;
- state and local governments and voluntary organizations in adapting use of the core measures to their needs and circumstances; and
- multiple stakeholders through the Center for Medicare & Medicaid Innovation in piloting implementation of the core measures through multilevel stakeholder initiatives.

Findings: Despite coordinating projects and programs, efforts to develop and implement measures for the U.S. health system remain fragmented and too often unproductive, with different groups at different levels taking different approaches to assessment and reporting. Progress in health will depend on aligned work by a broad range of stakeholder groups, whose collective efforts currently lack the necessary guidance that could be provided by a standardized core measure set.

Conclusions: A practical, parsimonious, meaningful core measure set that is relevant to the common agendas of different groups is needed to accelerate system-wide progress in health and health care. The Committee has proposed the necessary core measure foci and identified the best current measures, but in many cases, significant measure development and standardization are needed, and these efforts will require the involvement of multiple stakeholder organizations.

Recommendation 5: The Secretary of the U.S. Department of Health and Human Services should establish and implement a mechanism for involving multiple expert stakeholder organizations in efforts to develop as necessary, maintain, and improve each of the core measures and the core measure set as a whole over time. The Secretary's role should encompass stewardship of work on

- national standardization of the best current measures and related priority measures detailed in this report;
- development of the longer-term indicators necessary to improve the utility and generalizability of the core measures;
- national standardization of reporting on health disparities for each of the core measures, including disparities based on race, ethnicity, gender, and socioeconomic status;

- periodic review and revision of the individual measures in response to changing circumstances; and
- periodic review and revision of the core measure set in response to changing circumstances.

The Committee recommends that the Secretary have in place by 2016 a national plan for sustained application, monitoring, evaluation, and improvement of the core measure set.

The sample schematic presented in Figure 5-2 presents some of the likely elements needed in stewarding the implementation of core metrics from “Core Metrics 1.0,” as represented in this report by the best current measures and current national performance numbers, to “Core Metrics 2.0,” which will incorporate new, pilot-tested composites and will be informed by a multi-stakeholder process of achieving deep standardization of measure specifications at multiple levels.

Governors, Mayors, and Health Leaders

Findings: Data on health and health care in different states, counties, and regions often are insufficient for direct comparison on some of the most critical factors shaping the health of the population. The absence of reliable guideposts on the status of important preconditions for progress can result in delays and missed opportunities for learning, sharing best practices, and motivating action. Similarly, without comparable information from the state, county, and community levels, the ability of health stakeholders at these levels to work in a strategically coordinated fashion is fundamentally impaired.

Conclusions: Current understanding of the relative performance of the health system is limited by a lack of standardized measures and data that enable direct comparisons among states, communities, and institutions. A common set of reference points for assessing progress could enable shared focus and accountability and enhance coordination and engagement among key stakeholders with responsibility for health and health care at the community, county, and state levels.

Recommendation 6: Governors, mayors, and state and local health leaders should use the core measure set to develop tailored dashboards and drive a focus on outcomes in the programs administered in their jurisdictions, and they should enlist leaders from other sectors in these efforts.

Clinicians and Health Care Delivery Organizations

Findings: The number of quality measures that health care providers are required to report has increased significantly and imposes a burden on clinicians and health care organizations that is disproportionate to their potential benefit. Focus and streamlining of health measurement are needed to ensure that clinicians and health care delivery organizations have access to high-quality information with the least possible burden in terms of time and cost. A more focused measurement system could reduce formal reporting responsibilities and provide more local discretion on which non-core measures are most useful and important. Clinicians generate much of the data necessary for measurement, must translate measures into action for improvement, and can benefit directly from enhanced efficiency and effectiveness of measurement.

Conclusions: The active participation of clinicians and health care organizations is essential to remedy this situation and achieve the potential of a core measure set. Clinicians and health care organizations need to recognize the role of the core measures in improving care for individual patients and the health care enterprise.

Recommendation 7: Clinicians and the health care organizations in which they work should routinely assess their contributions to performance on the core measures and identify opportunities to work collaboratively with community and public health stakeholders to realize improvements in population health.

Employers and Other Community Leaders

Findings: The health of a population depends on actions in multiple settings and sectors. Therefore, improvement in health depends on effective leadership on the part of multiple stakeholders, including employers, schools, utilities, law enforcement, and others. Core measures can act as a tool that enables employers and other community leaders to identify gaps or shortfalls in the health of the population of concern and identify the services most important to their constituents, and that facilitates coordination among those involved in effecting change. In the case of employers, core measures also can serve as a tool for decision making regarding the allocation of health and health care resources to optimize the health of their employees.

Conclusions: Accountability for the health of any population or community is shared among a range of stakeholders. Providing individuals with reliable measures through which to understand personal and community health can enable more active participation and influence by employers and

other community leaders with respect to the decisions—both individual and collective—that impact health outcomes.

Recommendation 8: Employers and other community leaders should use the core measures to shape, guide, and assess their incentive programs, their purchasing decisions, and their own health care interventions, including initiatives aimed at transparency in health costs and outcomes and at fostering seamless interfaces between clinical care and supportive community resources.

Payers and Purchasers

Findings: The rising costs of care present a challenge for payers, purchasers, and the nation. This growing concern has led to a proliferation of requirements for data collection and reporting, as well as various approaches to accountability based on measurement. However, the success of efforts to assess and compare quality, efficiency, and other provider-specific factors has been limited by the absence of comparable standardized measures on which to base reliable conclusions.

Conclusions: Effective accountability depends on effective measures that target the results that matter most and act as accessible tools for making choices and changes in decisions about care. Core measures have the potential to act as a tool for more accurate, meaningful decision making for payers and purchasers by parsimoniously information on and enabling comparisons of health and health care performance for different populations or groups. To this end, harmonization is needed to ensure that reporting requirements are anchored in the issues that matter most and are implemented efficiently so as to provide the information needed by payers and purchasers.

Recommendation 9: Payers and purchasers of health care should use the core measures to capture data that can be used for accountability for results that matter most to personal and population health, to refine the analytics involved, and to make databases of the measures available for continuous improvement.

Standards Organizations

Findings: The proliferation of measures and reporting requirements is due in part to the expansion of measure development and implementation by standards organizations that encourage or require providers to report on performance for accreditation purposes. Despite some important advances in quality, the aggregate impact of the wide range of measures employed by

standards organizations remains uncertain. A lack of transparency due to proprietary data and measures limits the capacity to assess relative health outcomes and health care performance.

Conclusions: Support for core measures by standards organizations can enable efficiency and focus in measurement and monitoring of the impact of performance standards in the health system. Indeed, core measures are necessary for drawing reliable conclusions about standards and interventions that matter most in improving health and health care.

Recommendation 10: Measure developers, endorsers, and accreditors, such as the National Quality Forum (NQF), the National Committee for Quality Assurance (NCQA), and the Joint Commission, should consider how they can orient their work to reinforce the aims and purposes of the core measure set, and they should work with the Secretary of the U.S. Department of Health and Human Services in refining the expression and application of the core measure set nationally.

CRITICAL FACTORS FOR SUCCESS

Leadership

Leadership is critical to the success of any endeavor. Because the stakeholders and organizations involved in health and health care measurement are diverse and the scope of the core measures is broad, the Committee concluded that the Secretary of HHS, as the nation's senior and most visible health care policy maker and manager, is the logical leader to spearhead the multi-stakeholder effort of refinement, alignment, implementation, maintenance, and governance of the core measures at different levels of the health system. Leadership in the implementation of the core measure set also is required at other levels of the health system, including the community, county, and state levels, as well as from leadership within health stakeholder groups. For example, strong leadership on health at the corporate CEO level could orient care purchasing and planning decisions within a large company around the core measures so that meaningful comparisons could be made among care options, and health initiatives and policies could be focused on particular priorities or challenges in the health outcomes of the employee population. Similarly, leadership within the care system could enable collaboration and coordination with key community stakeholders by focusing on the outcomes of a patient population rather than the quality of care in isolation.

Strategy

In addition to a range of specific implementation priorities and considerations for different stakeholder groups, certain factors are critical for successful implementation that are common across stakeholders in the health system. Among these is the need for a strategic approach to implementing the core measures based on the local factors and considerations that matter most to a community or stakeholder group. While the core measures themselves present a standard approach to measuring priority outcomes, achieving the required level of data reporting and use will present different challenges for different groups. A thoughtful planning process with broad input from relevant parties could aid in supporting successful implementation by ensuring that responsibilities, challenges, and gaps are addressed early and that potential barriers to successful implementation are identified. The core measures could serve as a tool for strategy at multiple levels, including the state, local, and institutional levels. For example, a state governor could use the core measures as a dashboard for health—continually monitoring performance and progress in health and using the data produced to establish targeted improvement programs and strategies or to inform decisions about the allocation of funding. Similarly, a business leader could use the core measures as a tool for tailoring health spending, programming, and policy decisions to the particular needs, challenges, and priorities of the institution's population.

Incentives Alignment

Core measures present an opportunity for aligning incentives across the health system by drawing attention to the outcomes that matter most for the nation's progress toward health improvement. Many of the forces and incentives at play in the health system today are directed toward proxies or processes related to health rather than toward the true outcomes they are intended to influence. For example, fee-for-service models of care delivery incentivize the health care system to provide a high volume of services, although higher service volume does not necessarily equate to better outcomes or better quality of care. The core measures could be used to align incentives by a variety of organizations and at multiple levels. An accountable care organization charged with demonstrating impact on population health needs core measures as a straightforward and reliable assessment tool. Given the alignment of the core measures around health outcomes—which depend on a broad range of stakeholders both within and outside of the care system—the core measure set could serve as an incentive for enhanced coordination with outside groups, as well as promote innovative approaches to improving health that go beyond the provision of care services.

By focusing on a parsimonious set of high-level health elements, the core measure set could enable alignment of incentives across a broad range of stakeholder groups, potentially increasing the efficiency and effectiveness of the nation's efforts to improve health and care quality, to control costs, and to engage individuals and communities in the process.

Infrastructure

Core measures require robust, interoperable infrastructure for the routine collection and reporting of key data elements. While progress is being made across the country in the development and use of digital infrastructure components such as electronic health records, the nationwide health data infrastructure is characterized by numerous different systems with limited interoperability, disparate levels of use, and approaches to use based on local factors and needs. While in the short term, core measures at different levels may be assembled from unconnected data systems and with varying levels of detail and coverage, in the long term, core measures could drive progress in infrastructure development and interoperability around those measures that are of the highest priority for understanding and measuring progress in the health system.

Culture

Achieving successful implementation of the core measures will depend on how well the measures—and the approaches to their implementation—align with the culture and priorities of a stakeholder group or community. In particular, the core measures may meet with resistance if presented as a tool for assigning accountability or for assessing pay based on performance. Further, the emphasis on data sharing and comparability embodied in the core measures may run counter to some cultural norms of competition or proprietary information. Successful implementation of the core measures will depend on the ability of local leaders to account for cultural factors that may present implementation challenges and to ensure that the approach to implementation is tailored to cultural norms and priorities.

Continuous Learning

Finally, the core measures are not intended to be static, but rather a set of priority measures that will evolve over time in accordance with the needs and capabilities of the health system. Therefore, a continuous learning approach to implementation of the core measures, emphasizing the dynamic nature of the measures and the implementation process, can ensure that the core measures will serve as a sustained and reliable guide to and prompt for improvement and progress through decades to come.

A

Glossary

Clinical preventive services: Immunization, chemoprophylaxis, counseling, and screening with early intervention, provided to individuals to reduce their likelihood of disease, injury, or impairment, or to improve their overall health status and sense of well-being.*

Community: A group of people defined in many ways, such as by geography, culture, disease or condition, occupation, and workplace (IOM, 2012).

Community health programs: Actions sponsored by organizations, groups, or individuals within a community, to improve the status of the community and its most vulnerable citizens with respect to disease, injury, functional capacity, and sense of well-being.*

Continuous health care learning and improvement: The process of ongoing measurement and analysis to inform changes in the delivery of care. Continuous learning occurs both intra- and interinstitutionally and relies on the real-time capture and use of data on patient experience, outcomes, and process measures (IOM, 2012).

Core measures: A parsimonious set of measures that provide a quantitative indication of current status on the most important elements in a given field,

* This glossary entry has changed or was added after the prepublication version of this report.

and that can be used as a standardized and accurate tool for informing, comparing, focusing, monitoring, and reporting change.

Health system: See “Multisectoral health system.”

Learning health care system: A health care system in which science, informatics, incentives, and culture are aligned for continuous improvement and innovation, with best practices being seamlessly embedded in the care process, patients and families being active participants in all elements of care, and new knowledge being captured as an integral by-product of the care experience (Charter, IOM Roundtable on Value & Science-Driven Health Care).

Multisectoral health system: The array of sectors and entities that influence the health of the population through their activities, ideally in a coordinated manner, as a system, but in practice, operating through occasional and not always sustained collaboration. The system comprises public health agencies, health care delivery organizations, and parts of other sectors (e.g., businesses, schools) and the community (IOM, 2011). The report often shortens this term to “health system.”

Patient- and family-centered care: Patient and family-centered care is designed, with patient involvement, to ensure timely, convenient, well-coordinated engagement of a person’s health and health care needs, preferences, and values; it includes explicit and partnered determination of patient goals and care options; and it requires ongoing assessment of the care match with patient goals (IOM, 2015).*

Population health: The health of the public in a geopolitical location (IOM, 2013a).

Population health programs: Environmental, educational, organizational, social, or policy interventions that seek to advance the profile of a population group with respect to the level of disease, injury, functional capacity, and sense of well-being.*

Public health: Governmental action to advance health and safety through health promotion and health protection measures, through measures to ensure the quality and access of basic personal health services, and through enhanced understanding of factors shaping health status.*

Public health system: A complex network of individuals, organizations, and relevant critical infrastructures with the potential to act individually and

together to create conditions of health. The system encompasses communities, health care delivery systems (e.g., home care, ambulatory care, private practices, hospitals, skilled nursing facilities), employers and businesses, the media, homeland security and public safety agencies, academia, and the governmental public health infrastructure (IOM, 2013b).

Safe care: Care that involves making evidence-based clinical decisions to optimize the health outcomes of individuals and minimize the potential for harm. Errors of both commission and omission should be avoided (IOM, 2004).

Value: Assessed using the following heuristic: $\text{Value} = \text{Outcomes}/\text{Cost}$ (IOM, 2012).

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B

Existing Reporting Requirements

BIRTHS, DEATHS, AND REPORTING ON DISEASES OF CONCERN

In the United States, all vital events—such as births, deaths, and marriages—are recorded by local jurisdictions. These jurisdictions, including all 50 states, 5 territories, the District of Columbia, and New York City, vary in how they collect these data. Some have centralized vital records offices, while others have local registrars who manage the data. Jurisdictions also have local autonomy in the recording, processing, quality assurance, and analysis of the data. Although collected locally, the data are compiled nationally through a cooperative agreement with the National Center for Health Statistics in the Centers for Disease Control and Prevention (CDC). To ensure nationally uniform data, the agreement includes requirements for the data's consistency, quality, and timeliness (NRC, 2009).

The value of these data is that they are not samples but represent almost all of the vital events that occur throughout the country. In fact, recent studies estimate that more than 99 percent of births and deaths are currently included (Guyer et al., 2000). From these data, the National Vital Statistics System can provide snapshots of the nation's current status on a variety of dimensions, including (Guyer et al., 2000)

- death rates and life expectancy,
- leading causes of death,
- maternal and infant mortality rates, and
- population shifts.

These data can be analyzed to search for trends, make comparisons across states and countries, and assess progress (Kochanek et al., 2012).

In a similar fashion, the process of reporting certain diseases centers on local initiative. Each state has laws requiring that providers of health care—laboratories, hospitals, individual clinicians—report incidences of particular diseases to their state or local health department. As with vital statistics, these data come from 57 jurisdictions, which vary as to the specific notifiable diseases that must be reported (CDC, 2012b). The completeness of reporting varies as well, although it appears to depend more on the particular disease than on geographic location (CDC, 2012b; Doyle et al., 2002). One challenge is that there often is little connection between the data stored in electronic health records and public health disease surveillance systems, except in a limited number of pilot initiatives (Klompas et al., 2012a,b).

National figures are calculated voluntarily by states, which share portions of their data with the National Notifiable Diseases Surveillance System, operated by the CDC in collaboration with the Council of State and Territorial Epidemiologists. For example, the list of nationally notifiable infectious diseases is developed through a collaborative process in which the Council of State and Territorial Epidemiologists, with input from the CDC, makes annual recommendations for additions to and deletions from the list. As shown in Box B-1, almost 70 diseases were listed for 2013, ranging from anthrax to cholera to HIV to yellow fever (CDC, 2013).

At the state and local levels, these data assist with conducting disease surveillance, controlling outbreaks, and managing and evaluating prevention activities. At the national level, these data can help with monitoring disease trends, managing and evaluating prevention activities and strategies, identifying high-risk populations or regions, and identifying and controlling potential outbreaks (CDC, 2012a,b).

PAYER-REQUIRED REPORTING OF THE DELIVERY AND PERFORMANCE OF MEDICAL CARE

The Centers for Medicare & Medicaid Services (CMS) uses measures for multiple purposes—ranging from performance-based payment to public reporting—for the Medicare and Medicaid programs and the Children’s Health Insurance Program (CHIP). As Table B-1 illustrates, several hundred measures are currently in use in each of the measure categories. Table B-2 shows the focus of these measures, which tend to capture care processes. However, a significant number of measures are now devoted to assessing health outcomes. The measures address primarily ambulatory, inpatient, and home care, although measures exist for many other care settings (see Table B-3). Finally, Table B-4 shows that reported measures address care

BOX B-1
National Notifiable Infectious Conditions (2013)

Anthrax	Novel influenza A virus infections
Arboviral diseases, neuroinvasive and nonneuroinvasive	Pertussis
Babesiosis	Plague
Botulism	Poliomyelitis, paralytic
Brucellosis	Poliovirus infection, nonparalytic
Chancroid	Psittacosis
Chlamydia trachomatis infection	Q fever
Cholera	Rabies, animal
Coccidioidomycosis	Rabies, human
Cryptosporidiosis	Rubella
Cyclosporiasis	Rubella, congenital syndrome
Dengue virus infections	Salmonellosis
Diphtheria	Severe acute respiratory syndrome—associated
Ehrlichiosis and anaplasmosis	coronavirus disease
Giardiasis	Shiga toxin-producing <i>Escherichia</i> <i>coli</i>
Gonorrhea	Shigellosis
Haemophilus influenzae, invasive disease	Smallpox
Hansen's disease	Spotted fever rickettsiosis
Hantavirus pulmonary syndrome	Streptococcal toxic-shock syndrome
Hemolytic uremic syndrome, postdiarrheal	Syphilis
Hepatitis A, acute	Tetanus
Hepatitis B, acute	Toxic shock syndrome (other than streptococcal)
Hepatitis B, chronic	Trichinellosis
Hepatitis B, perinatal infection	Tuberculosis
Hepatitis C, acute	Tularemia
Hepatitis C, past or present	Typhoid fever
HIV infection (AIDS has been reclassified as HIV Stage III)	Vancomycin-intermediate staphylococcus aureus and vancomycin-resistant staphylococcus aureus
Influenza-associated pediatric mortality	Varicella
Invasive pneumococcal disease	Varicella deaths
Legionellosis	Vibriosis
Listeriosis	Viral hemorrhagic fever
Lyme disease	Yellow fever
Malaria	
Measles	
Meningococcal disease	
Mumps	

TABLE B-1 Uses for Measures Employed by the Centers for Medicare & Medicaid Services

Measure Use	Number of Measures
Public reporting	283
Quality reporting	655
Pay for performance	286
Pay for reporting	84

NOTE: A measure may have multiple uses and may be represented in more than one category. As a result, sums of the table categories would be inaccurate.
SOURCE: U.S. Department of Health and Human Services Measure Inventory, 2013.

TABLE B-2 Focus of Measures Employed by the Centers for Medicare & Medicaid Services for Reporting Purposes

Measure Focus	Number of Measures
Access	21
Efficiency	12
Outcome	222
Patient experience	41
Process	580
Structure	25
Other	12

SOURCE: U.S. Department of Health and Human Services Measure Inventory, 2013.

quality and outcomes for a diverse group of conditions and topics, with the category of cardiovascular and stroke receiving particular attention.

PROGRAMS OPERATED UNDER WAIVER AUTHORITY

In Medicaid and CHIP, new delivery system models and payment strategies can be tested using waivers, which give states the flexibility to tailor programs to their needs and priorities. Currently, there are almost 400 active waivers (CMS, 2013).

Four primary types of waivers exist (CMS, 2013):

- research and demonstration waivers (section 1115),
- managed care waivers (section 1915(b)),

TABLE B-3 Care Settings for Reported Measures Employed by the Centers for Medicare & Medicaid Services

Care Setting	Number of Measures
Ambulatory surgery center	8
Ambulatory/office-based care	469
Dialysis facility	30
Home care	101
Hospice	2
Hospital inpatient	194
Hospital outpatient	28
Inpatient rehabilitation facility	2
Long-term care facility	39
Long-term care hospital	5
Managed care plan	33
Other	2

SOURCE: U.S. Department of Health and Human Services Measure Inventory, 2013.

TABLE B-4 Selected Topics or Conditions for Reported Measures Employed by the Centers for Medicare & Medicaid Services

Condition/Topic	Number of Measures
Cancer	45
Cardiovascular and stroke	137
Central nervous system (dementia, Parkinson's, epilepsy)	19
Chronic and elder care	57
Communicable diseases (immunizations, methicillin-resistant staphylococcus aureus [MRSA], influenza)	53
Dental	4
Diabetes	40
Mental health and substance abuse	59
Musculoskeletal (osteoarthritis, rheumatoid arthritis, back pain)	29
Patient experience	47
Patient safety	97
Respiratory conditions	34
Surgical procedures	54

SOURCE: U.S. Department of Health and Human Services Measure Inventory, 2013.

- home- and community-based services waivers (section 1915(c)), and
- continuum of care to the elderly and people with disabilities waivers (concurrent section 1915(b) and section 1915(c)).

In general, the research and demonstration waivers can allow for more comprehensive programmatic flexibility (although some are written quite narrowly), while the managed care and home- and community-based services waivers focus on specific populations and services. States can use research and demonstration waivers for testing new approaches, including expansion of coverage to individuals not otherwise eligible for Medicaid or CHIP, provision of coverage for services not typically covered by the program, or the application of delivery system innovations to improve the quality and value of care (Alker and Artiga, 2012; Artiga, 2011).

A research and demonstration waiver is approved through negotiations between the state and the U.S. Department of Health and Human Services (HHS) agencies, sometimes with the involvement of the U.S. Office of Management and Budget (OMB) as well. Once a waiver has been approved, the state receives an award letter explaining which specific sections of the Social Security Act or other regulations are being waived and describing the terms and conditions of approval. One important metric is the cost of the program, as all approved projects must be budget neutral to the federal government over the course of the waiver. Because these types of waivers are intended for research purposes, the state is required to have an approved evaluation strategy in place (Alker and Artiga, 2012; Artiga, 2011). Generally, states have substantial flexibility in how they carry out their evaluation—including experimental and other quantitative and qualitative designs—with the constraints that the final evaluation design must be approved by CMS and published publicly.¹

The Patient Protection and Affordable Care Act (ACA) augmented waiver authority by creating the CMS Innovation Center, which has the ability to test, evaluate, and expand care delivery and payment models in Medicare, Medicaid, and CHIP. If these models are found to be successful, the Secretary of HHS has the authority to scale them up nationally. Again, there is flexibility in what constitutes success, and the CMS actuary must verify that these models lead to spending reductions. In addition, another section of the ACA provides for State Innovation Waivers, which will allow states to test new models for their insurance exchanges; qualified health plans; and other benefit, cost sharing, and coverage provisions (Alker and Artiga, 2012; Artiga, 2011).

¹ 42 CFR 431.424.

Public and private payers have introduced multiple new payment models to move away from fee-for-service payment and align incentives toward high-quality, high-value care. These new payment models often require clinicians and hospitals to collect and report multiple measures on care processes and outcomes. In some cases, financial incentives are tied directly to performance on a given measure, while in others the measure is used to ensure that quality and outcomes remain consistent under the new payment method (Schneider et al., 2011). Table B-5 shows the multiple categories of payment models currently in use and for each model, the categories of measures employed (in dark gray), as well as the categories of measures discussed in program documentation (in light gray). Table B-6 illustrates the care settings assessed by different payment models, demonstrating that some models are focused exclusively on one care setting, such as inpatient care, while others consider outcomes from all settings.

REPORTING ON FEDERAL CATEGORICAL GRANT PROGRAMS

Federal grants to state and local governments are significant, accounting for more than \$600 billion in fiscal year 2011, and the number of such grant programs has increased over the past three decades. The focus of these grant programs has shifted over time, with an increase in funding for Medicaid and other health programs and a decrease in funding for other activities. In recent reviews of federal grants, the U.S. Government Accountability Office (GAO) found a lack of appropriate performance measures and accurate data for agencies to use in assessing the performance of grant programs and ensuring that grant funds are being spent effectively (GAO, 2006, 2012). The specific measures and strategies used to assess performance and provide for accountability vary, with the details being determined by authorizing and appropriations legislation; the agency's grant management, such as funding announcements and notification processes; and government-wide grant management legislation, regulations, and executive orders. Given the multiple types of federal grants—from categorical grants that focus on one activity to block grants that allow choice among a range of activities—some programs may want to provide for substantial flexibility in their assessment, while others may want to provide for greater accountability (GAO, 2006). Furthermore, agencies often are challenged by a lack of accurate and credible performance data, especially when those data are provided through third parties (GAO, 2012).

States have a long history of publicly reporting information on health care performance. One of the first state performance reports came from the New York State Department of Health, which in 1989 started publishing data on risk-adjusted mortality for cardiac bypass surgery (Chassin, 2002). The number of such programs has continued to grow, and at least half of

TABLE B-5 Reporting Requirements for Different Payment Models by Measure Focus

		Payment Reform Models										
Measurement Domain	Outcome											
		Global Payment	ACO Shared Saving Program	Medical Home	Bundled Payment	Hospital-Physician Gain-sharing	Payment for Coordination	Hospital P4P	Payment Adjustment for Readmissions	Payment Adjustment for Hospital-Acquired Conditions	Physician P4P	Payment for Shared Decision Making
Outcome	Mortality											
	Health status											
	Morbidity											
	Functional status											
	Health-related QoL											
	Safety Outcomes											
	Patient experience/satisfaction											
	Other outcome											
	Population health											
	Preventive services											
Process	Healthy behaviors											
	Clinical care											
	Care coordination											
	Patient/family/ caregiver engagement											
	Safety practices											
Other process												

NOTES: No shading: no measure statements, measures, or measure sets in program documentation.
 Light shading: measure statements, but no measures or measure sets in program documentation.
 Dark shading: specific measures or measure sets fit within this domain, or program documentation names a specific measurement algorithm.
 ACO = accountable care organization; ER/ED = emergency room/emergency department; HIT = health information technology; LOS = length of stay; P4P = pay for performance; QoL = quality of life.
 SOURCE: Schneider et al., 2011.

TABLE B-6 Reporting Requirements for Payment Models Organized by Their Care Setting

		Payment Reform Models										
Measurement Domain	Clinician office Hospital/ acute care facility	Global Payment	ACO Shared Saving Program	Medical Home	Bundled Payment	Hospital-Physician Gain-sharing	Payment for Coordination	Hospital P4P	Payment Adjustment for Readmissions	Payment Adjustment for Hospital-Acquired Conditions	Physician P4P	Payment for Shared Decision Making
Inpatient	Outpatient											
Laboratory	Imaging											
Clinic	Other outpatient											

[illegible]

NOTES: No shading: setting not mentioned in program documentation.

Light shading: setting mentioned in program documentation.

ACO = accountable care organization; ASC = ambulatory surgery center; ER/ED = emergency room/emergency department; HIT = health information technology; LTC = long-term care; P4P = pay for performance; SNF = skilled nursing facility.

SOURCE: Schneider et al., 2011.

the states now sponsor a public reporting program focused on care quality. These programs vary considerably as to whether they include information on care processes or health outcomes, whether they describe performance only for common diseases or for many diseases, and how their data are generated (Ross et al., 2010). In addition to public reporting, more than half of all states operate a hospital adverse event reporting system, which requires that the hospital report the incidence of specific types of patient harm. These systems vary significantly from state to state with respect to what types of adverse events must be reported (Levinson, 2008; Wright, 2012).

REPORTING TO REGULATORY AND CERTIFICATION BODIES

A variety of organizations are involved with accreditation of health care in the United States, including the Joint Commission and the National Committee for Quality Assurance (NCQA). The Joint Commission accredits approximately 20,000 health care organizations and programs, while NCQA accredits health plans and offers voluntary programs for new care delivery models (Berenson et al., 2013).

COMMON THEMES AMONG REQUIREMENTS

In a recent review of measures, RAND Corporation found that many organizations are using measures for multiple purposes, which implies that they are realizing the value of aligning measures across uses. RAND also found that measures are used most commonly for quality improvement and public reporting, while payment uses are almost half as common, and an even smaller number of measures are used for accreditation, certification, credentialing, and licensure. Process measures are the most commonly used type of measure, and claims and administrative data are the most common data sources used to calculate measures (Damberg et al., 2011).

This section describes characteristics of publicly reported measures based on data from the National Quality Measures Clearinghouse. This clearinghouse, a project of the Agency for Healthcare Research and Quality (AHRQ), contains more than 2,000 different quality measures that are in use or have recently been tested. An analysis of the subset of clearinghouse measures that are used for public reporting shows that most focus on the effectiveness of clinical prevention and treatment, with fewer being devoted to other National Quality Strategy aims (see Table B-7). Further, Table B-8 illustrates that publicly reported measures focus on ambulatory care, inpatient settings, and managed care plans, although they address many other elements of the health system as well.

TABLE B-7 Number of Publicly Reported Measures by Aim of the National Quality Strategy

National Quality Strategy Aim	Number of Publicly Reported Measures
Effective communication and care coordination	16
Health and well-being of communities	121
Making care safer	42
Making quality care more affordable	4
Person- and family-centered care	83
Prevention and treatment of leading causes of mortality	312

SOURCE: Analysis of National Quality Measures Clearinghouse data. Accessed May 31, 2013.

TABLE B-8 Number of Publicly Reported Measures by Setting or Organization Assessed

Element of the Health System	Number of Publicly Reported Measures
Ambulatory/office-based care	159
Ancillary services	16
Assisted living facilities	0
Behavioral health care	10
Community health care	20
Emergency medical services	11
Emergency room	9
Home care	21
Hospices	9
Hospital inpatient	89
Hospital outpatient	14
Intensive care units	4
Managed care plans	88
Rehabilitation centers	11
Residential care facilities	12
Rural health care	10
Skilled nursing facilities	15
Substance use treatment programs/centers	1
Transition	16

SOURCE: Analysis of National Quality Measures Clearinghouse data. Accessed May 31, 2013.

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C

Existing Data Sources

A variety of data sources already in use could be leveraged to support measurement. These data sources cover different populations, conditions, and aspects of care and are directed toward a variety of end uses, including direct clinical care, payment decisions, quality assessment, and population tracking, among others. There is also significant variation in data collection processes. This appendix describes data sources available for assessing progress along each of the four study dimensions: population health, quality of care, cost of care, and engagement in health and health care.

POPULATION HEALTH

Data on the health of populations come from a variety of sources:

- individual-level social data (e.g., social and economic status; demographics; access to social and economic services, child and family services, elderly services, and home health services);
- population surveys (e.g., National Health Interview Survey [Census Bureau and Centers for Disease Control and Prevention], National Health and Nutrition Examination Survey [NHANES], U.S. Census);
- reportable diseases (e.g., state notifiable disease reporting systems, National Notifiable Diseases Surveillance System); and
- vital statistics (e.g., local, state, and national vital statistics registries; National Death Index).

These data provide important information about the health of the nation as a whole and may offer insight into the impact of large-scale population health interventions. These data are some of the most comprehensive in the field of health measurement, with coverage of vital statistics and census data approaching 100 percent of the population (Guyer et al., 2000).

One significant challenge for health care measurement is the need to break down the artificial barrier between individual and population health. Doing so could allow for routine comparison of individual health against the health of communities or demographic groups. Furthermore, continuous individual and community health data could allow for more precise, targeted population health interventions tailored to specific environmental and social factors.

QUALITY OF CARE

A variety of data sources can be used to assess the quality of health care, including

- patient-level clinical care data (e.g., electronic health records, registries);
- population-level safety data (e.g., adverse event reporting registries, public health surveillance);
- population-level clinical data (e.g., cancer, chronic condition, and screening registries);
- claims data (e.g., Medicare claims, private payer claims, multi-payer and all-payer claims databases);
- patient-reported outcomes (e.g., National Institutes of Health [NIH] Patient Reported Outcomes Measurement Information System [PROMIS], Short Form [36] Health Survey [SF-36]);
- surveys (e.g., National Hospital Care Survey, National Ambulatory Medical Care Survey, Medicare Current Beneficiary Survey, National Home and Hospice Care Survey, Medicare Health Outcomes Survey); and
- operational and financial data for health care organizations.

Care quality measures traditionally have been calculated from administrative data, such as claims, which remain the most common source for quality measurement today (Damberg et al., 2011). Administrative data often have been used because of the absence of other data sources for large-scale analysis, but they also have other advantages—they are broadly available and inexpensive to collect and contain extensive information about medical care. Yet claims data often lack significant clinical details that are important for understanding the appropriateness of medical care

and identifying clinically relevant populations. One study found that claims data were able to identify only 75 percent of patients with diabetes, while automated analyses of electronic health record data were able to identify 97 percent of such patients (Tang et al., 2007). Another study found that claims data recorded several preventive services for patients with diabetes (cholesterol screening, influenza vaccination, nephropathy screenings, and A1C testing) only half of the time (Devoe et al., 2011), and still another study found that claims data failed to capture the provision of many recommended services in pediatric care (Casciato et al., 2012). Claims data also may miss significant subpopulations, including the uninsured, the underinsured, or the discontinuously covered.

An additional barrier to deriving accurate measures from claims data is that individual clinician experience for patients with a given condition (especially rare conditions) is limited by health plan enrollment. As each payer collects and maintains its claims data separately, the statistical accuracy of these performance measures may be low, meaning that two similar clinicians may appear to have very different performance results (Landon and Normand, 2008; Landon et al., 2003; Scholle et al., 2008, 2009). One method for overcoming this challenge is to combine data across multiple payers, an approach that has been piloted successfully in several states (Higgins et al., 2011; Toussaint et al., 2011).

Electronic health records offer another opportunity to improve quality measurement, as these data sources contain detailed information on care processes. To achieve that potential, digital record systems must capture the necessary data elements from routine clinical care in a standardized, codified fashion and be able to exchange that information across data systems. Although progress has been made, this capability still is not a reality in many circumstances. Despite a significant investment in electronic health records, for example, a patchwork of such systems exists that capture data elements in inconsistent formats, and it may not be easy to transmit the data to other systems (Chan et al., 2010; Gold et al., 2012; IOM, 2011, 2012; Kern et al., 2013; Parsons et al., 2012). One study found that quality measures calculated automatically from electronic health records could differ significantly from measures derived from manual review of the clinical records—overestimating the provision of some services and underestimating the provision of others (Kern et al., 2013). Other challenges include substantial variation in the use of terminology, such as “shock”; variation in the meaning of different terms used for the same concept; and limited common standards for documentation (Berenson et al., 2013). These challenges highlight the importance of implementation in unlocking the potential of these new data sources.

Further, depending on the site of a clinician’s practice and patient population characteristics, high-quality care that is delivered may result in

very different outcomes because of patients' exposure to social determinants of health and differential community factors that impact health. Accurate measurement will depend on the use of data sources that capture this information, which can then be used to "equalize" performance and quality based on patient complexity and baseline need for health care services.

One key consideration is that many of the existing technical specifications for measures fail to take advantage of the capabilities of new digital infrastructure, as the measures were designed for other data sources. One study found that measures designed for claims data can be adapted to be calculated from digital records, but the adapted measures do not take full advantage of the new data source, and information may be lost in the transition. For example, the study found that claims-based data showed that fewer than 1 percent of patients had annual body mass index (BMI) documentation, while data from electronic health records showed more than 70 percent (Gold et al., 2012).

Another consideration is that no secondary data source contains all of the relevant information needed (e.g., social determinants of health often are missing from claims and electronic health record data but may be found in survey data). Given the limitations of each data source, some measures are calculated from hybrid data that draw on multiple data sources, such as merging of administrative data with clinical, survey, or operational data (NQF, 2013).

COST OF CARE

The body of data on health care costs is relatively small compared with the volume and variety of data collected on health care quality. Furthermore, cost data are not linked consistently with clinical and demographic data, which limits their usefulness. The data sources currently available for assessing the cost of care include

- single-payer claims data (e.g., Medicare claims data, private payer claims);
- multi-payer claims databases (e.g., state all-payer claims databases, FAIR Health, Health Care Cost Institute);
- surveys (e.g., American Heart Association [AHA] Annual Survey of Hospitals with information technology [IT] supplement, Medical Expenditure Panel Survey, Medicare Current Beneficiary Survey);
- organization operational data;
- organizational chargemasters; and
- the Healthcare Cost and Utilization Project (HCUP).

Claims and billing data account for the majority of health care cost data currently collected. Medicare, for example, maintains a comprehensive database of claims information. A variety of local-, state-, and national-level multi-payer claims databases aggregate cost data across providers for a more complete picture of health care costs and prices. As of May 2013, 10 states—Colorado, Kansas, Maine, Maryland, Massachusetts, Minnesota, New Hampshire, Tennessee, Utah, and Vermont—had implemented an all-payer claims database. These databases can help inform policy initiatives and provide greater knowledge on how costs compare across counties and over time (NCSL, 2013).

Data on health care costs also are collected through routine surveys, including the AHA Annual Survey of Hospitals with IT supplement, the Medical Expenditure Panel Survey, and the Medicare Current Beneficiary Survey. The HCUP, a project of the Agency for Healthcare Research and Quality (AHRQ), collects both nationwide and state-specific longitudinal data from hospitals in the United States, bringing together clinical, administrative, and cost data at the encounter level.

Another challenge is that the prices for health care services generally are confidential or difficult to obtain. Those data that are available show that prices also are highly variable. This variability is due to a variety of factors, including the fragmented billing of different providers for an episode of care; varied negotiated rates for different health plans; and legal factors such as antitrust law, contractual obligations between insurers and providers, and hesitancy to disclose negotiated rates (GAO, 2011). Given the variation in health care prices (Office of Attorney General Martha Coakley, 2011), the lack of data in this area limits the ability of consumers and patients to select the highest-value care.

ENGAGEMENT IN HEALTH AND HEALTH CARE

Data on patients' health care perspectives and experiences are collected primarily through surveys, which usually employ self-reporting or interview instruments. Examples of surveys used today to assess patient perspectives include the Health Center Patient Satisfaction Survey, used by the Health Resources and Services Administration (HRSA), and the Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey suite, which considers patient experiences with inpatient care, outpatient care, health plans, and other health care stakeholders and venues. One challenge with survey data is ensuring that they are captured frequently enough to allow clinicians and health care organizations to gauge whether initiatives have improved patients' experience and satisfaction. One limitation of this type of data is that patients tend to over- or underreport when surveyed as a result of recall and response bias, and there may be systematic differences

in responses among demographic groups. Obtaining an adequate response to surveys also requires significant financial and staff resources, as survey validity depends on a robust patient sample.

A conceptual challenge with assessing the extent to which the health care system aligns with patients' needs and values is uncertainty in how to measure the patient perspective, as well as how to assess patient involvement in health and health care. Multiple terms are used to describe this goal—including patient satisfaction, patient experience, patient perception, and patient ratings—with each term describing different but overlapping concepts. Part of the conceptual challenge is that patients consider a number of issues in determining whether care is of high quality, including technical expertise, staff interactions, and communications and information availability (Gao et al., 2012; Sofaer and Firminger, 2005); therefore, metrics need to be comprehensive to capture all of the aspects of care that patients consider.

There is further confusion on how well survey measures of patient-centeredness correlate with improved health outcomes. Some studies have found that higher patient satisfaction is correlated with lower readmission rates (Boulding et al., 2011) and lower mortality rates for heart attack patients (Glickman et al., 2010). In contrast, others have found that greater patient satisfaction is associated with higher utilization of health services, higher costs, and increased mortality (Fenton et al., 2012) or that increased patient involvement in decisions is linked to increased hospital lengths of stay and higher costs (Tak et al., 2013). Further research is needed to understand these relationships and to identify the components of patient-centered care that result in improved health.

The concept of health means different things to different people. Broadly, patients tend to define health outside the bounds of the health care system, underscoring their preference for care that considers their individual needs and circumstances rather than just their diseases. The literature on patient views of health—taken largely from surveys and focus groups—reveals some general concepts of how patients often define health, noting that perceptions of health are frequently nuanced and personal:

- *Avoiding care:* Patients tend to define “health” as the absence of a need for medical care or the absence of physical limitations that adversely affect their daily lives.
- *Resolving uncertainty:* Patients value care that aids in resolving uncertainty about the current or future state of their health (Detsky, 2011).
- *Wellness and happiness:* Patients view health in social, environmental, economic, and behavioral, not solely biological, terms.

Significant gaps exist in the delivery of information, tools, and resources that would enable people to make improvements in their own health and the health of their family and community, and their ability to engage with the care system. Improvement will require not only engagement by individuals in their own health management but also—and equally important—engagement of the community with patient needs. In this report, the Committee frames this model of people’s involvement as “engagement in health and health care,” encompassing engagement with resources both within and outside of the health care system, as well as the development and use of critical skills and resources that enable patients to improve their own health and care. This model of engagement represents the subjective experience of the individual, personal priorities, understanding of the actions individuals need to take to improve their health, and the societal factors needed to promote good health. This engagement in health represents a key component of shared accountability for health, with patients being active participants in individual, community, and national health improvement efforts. Additional research and development is needed to ensure that health care—and the measures used to assess it—incorporate the views, needs, and priorities of patients.

While the domains of individual and community engagement includes priority areas such as shared decision making, self-care, and patient satisfaction, the perspective of the individual patient—which includes all members of the public at some point in their lives—was central to the Committee’s selection of core measures across all four of the domains. In this way, the measure set is intended to frame measurement and improvement efforts around what matters most for the health of individuals, communities, and the nation.

People’s Perspectives on Health Care

There are multiple misconceptions about what people want from the health care system, with prior studies indicating that significant differences exist between what clinicians believe patients want and what patients actually value (Hibbard and Sofaer, 2010). Research shows that patients weigh multiple factors in assessing the quality of health care. For example, one study examined patient views through focus groups, surveys, and collaborations with consumer organizations and found that patients valued four broad areas in their care (Bechtel and Ness, 2010):

- *Whole-person care*: understanding the whole of the patient and the factors that may affect patients’ ability to improve and maintain their health.

- *Comprehensive communication and coordination:* comprehensive coordination and smooth transitions of care, medical information shared seamlessly, and explanations of care options.
- *Patient support and empowerment:* partnerships in making care decisions; support for self-management; trust; and respect for patient preferences, privacy, and physical and emotional needs.
- *Ready access:* ease of obtaining appointments, limited wait times, availability of the care team when needed through different mediums (phone, email, online, in person), and accommodation of the factors that may impede access, such as a lack of physical mobility, cognitive impairment, or language barriers.

The following list consolidates overarching themes from the literature on patient views of health care quality, along with specific descriptive concepts for each theme (Sofaer and Firminger, 2005). While these themes represent an attempt to capture general values and expectations, each patient is different, and many patients value care that is tailored to their particular circumstances and conditions:

- *Patient-centered care:* having all physical and emotional needs met, receiving care tailored to individual needs and values, being involved with decision making and care, and having family and caregivers involved as needed.
- *Access:* timeliness of routine and urgent care, affordability, and accommodations for individual preferences and limitations.
- *Communication and information:* open communication and information flow, listening, understanding what to expect, and prompt communication of test results.
- *Courtesy and emotional support:* sensitivity, compassion, trust, friendliness, and clinical care that incorporates social and emotional qualities.
- *Efficiency of care and effective organization:* coordination among clinicians, access to the same care providers over time, accurate billing, efficient referrals, and limited waiting times.
- *Technical quality:* technical knowledge, competence, experience, credentials, effective treatments, accurate diagnoses, and care that results in good health outcomes and improved quality of life.
- *Structure and facilities:* easy access to transportation and parking, safety and security, comfort, food quality, and up-to-date technology.

Beyond these themes, focus group research has identified additional areas of importance:

- *Relationships*: personal relationships with primary care clinicians.
- *Science*: evidence-based care that accommodates personal choice and preferences (Alston et al., 2012; Carman et al., 2010).

As with people's views about health, these broad themes describe common perspectives across the population, but individuals' views may vary based on their background, needs, circumstances, and goals.

People's Perspectives on Cost, Quality, and Value

While views on health care quality vary significantly from patient to patient, surveys suggest that at the individual level, patients tend to view all health care organizations and clinicians as offering similar-quality care, or they believe that all care meets some minimum standard. This belief is due in part to a lack of transparency, the release of information that is difficult to understand, and the lack of standardization of measures. This belief may discourage patients from seeking out information about care quality or make them uninterested in the quality information they do encounter (Blendon et al., 2011; Carman et al., 2010; Hibbard and Sofaer, 2010; Kaiser Family Foundation, 2008, 2011).

The cost of health care is a relatively new focus for the nation. Historically, there has been little public awareness of the cost associated with health care, with an often deliberate separation of discussion of cost and care by providers and obscured data as a result of the dissociation of care delivery from payment. In general, people may be reluctant to discuss the cost and value of health care (Hibbard and Sofaer, 2010). These perceptions can impede the success of initiatives that encourage people to review cost and value information in making their decisions about clinicians, health care organizations, or care options (O'Kane et al., 2012).

Without useful information about quality, consumers may equate higher cost with higher quality (Hibbard et al., 2012). If this perception leads more people to seek high-cost providers, cost reports lacking information on quality have the potential to increase costs. As a result, cost information needs to be integrated meaningfully with information about the quality of health care services and providers to highlight that higher-quality care can be delivered at lower cost (Carman et al., 2010; Hibbard and Sofaer, 2010; Hibbard et al., 2012; Sinaiko and Rosenthal, 2011). The communication of this information about cost and quality also is critical, as the information must be understandable, relevant, persuasive, and readily accessible if it is to be utilized by individuals.

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D

Existing Infrastructure

This appendix includes the range of sentinel measurement initiatives that the Committee considered throughout its deliberations. A list of these measurement initiatives and a chart summarizing their common features are included here. A complete catalog of these measurement initiatives with additional detail is available online at <http://www.nap.edu/catalog/19402>.*

* This introductory text was added after the prepublication version of this report to reflect that part of the Appendix is now available only online.

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Projects

ASPE Health System Measurement Project

Blue Cross Blue Shield of Massachusetts: Alternative Quality Contract

Buying Value Coalition: Buying Value Ambulatory Core Set

Canadian Institute for Health Information: Canadian Health System
Performance Measurement

CDC Surveys (e.g., NHANES, NHCS, NHIS, NVSS)

CMS: Health Homes Core Measures

CMS: Medicaid Adult Health Care Quality Core Set

CMS: Medicaid/CHIP Children's Health Care Quality Measures (2013
Set)

CMS: Medicare Advantage Rating Measures

CMS: NQF Evolving Core Measure Set for Dual Eligible Beneficiaries

CMS: Shared Savings Program (ACOs)

The Commonwealth Fund: Why Not the Best?

Consumer Reports Health: Hospital Quality Measures

CQO Roundtable: Illustrative Set of Quality, Outcome, and Cost
Measures

DOD: Military Health Service Strategic Imperatives Scorecard

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HHS: National Quality Strategy Measures

HRSA: Core Clinical Measures

IHA: P4P California Core Measure Set

IHI: Measures for Triple Aim Communities

Joint Commission: Accountability Measures

Joint Commission Example: Acute Myocardial Infarction Core Measure
Set

Leapfrog: Hospital Safety Score Methodology

NCQA: HEDIS Measures (Health Plans, 2013)

ONC: Meaningful Use Clinical Quality Measures for Eligible Hospitals
(2014)

ONC: Meaningful Use Clinical Quality Measures for Providers (2014)

Oregon Health Authority: Coordinated Care Organization Core
Measures

Patient-Centered Medical Home Evaluators Collaborative

Premier: QUEST Measures

State of California: Let's Get Healthy California

State of Massachusetts: Standard Quality Measure Set

State of Minnesota: Statewide Quality Reporting and Measurement
System

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State of Vermont: ACO Core Measure Set

United Health Foundation: America's Health Rankings

University of Wisconsin: County Health Rankings

Veterans Health Administration: ASPIRE Measure Set

World Health Organization Millennium Development Goal Scorecard

Summary of Similarities and Differences Among Ongoing Core Metrics Projects													
		Aim				Safety				Other measures of quality			
Sponsoring organization or program	Core metric initiative	<i>Population health</i>	<i>Health care quality</i>	<i>Cost</i>	<i>Patient engagement</i>	<i>Adverse events/errors</i>	<i>Antibiotic prophylaxis</i>	<i>HC-associated infection</i>	<i>Medication review or reconciliation</i>	<i>Access</i>	<i>Preventive & screening services</i>	<i>EHR use</i>	<i>Care transitions/coordination</i> <i>Disparities/equity</i>
ASPE	Health System Monitoring Project	X	X	X	X		X	X	X	X	X	X	X
Blue Cross/ Blue Shield of Massachusetts	Alternative Quality Contract		X	X	X		X	X	X	X	X		
Buying Value Coalition (employers, purchasers), convened by NQF	Buying Value Core Set		X	X	X					X	X		X
Canadian Institute for Health Information	Canadian Health System Performance Measurement	X	X	X		X				X	X		
CDC	Health surveys (e.g., NHANES, NHCS, NHIS, Vital Statistics)	X	X	X	X				X	X	X	X	X
CMS	Medicare Advantage Ratings	X	X		X				X	X	X		X

Summary of Similarities and Differences Among Ongoing Core Metrics Projects														
		Health outcomes and population health			Patient centeredness		Condition focus					Cost and utilization		
Sponsoring organization or program	Core metric initiative	Mortality (outcome or population)	Health factors/risk/behaviors	Current functioning/quality of life	Patient experience/satisfaction	Shared decision making	Diabetes	Cardiovascular conditions	Respiratory conditions	Cancer care	Mental health	Care utilization	Resource use/health care expenditures	Number of measures
ASPE	Health System Monitoring Project		X	X				X	X	X	X	X	X	59
Blue Cross/ Blue Shield of Massachusetts	Alternative Quality Contract	X			X		X	X	X	X	X			80
Buying Value Coalition (employers, purchasers), convened by NQF	Buying Value Core Set				X	X	X	X	X	X	X	X	X	38
Canadian Institute for Health Information	Canadian Health System Performance Measurement	X	X								X	X	X	15
CDC	Health surveys (e.g., NHANES, NHCS, NHIS, vital statistics)	X	X	X	X							X	X	
CMS	Medicare Advantage Ratings			X	X		X	X		X	X	X		37

Summary of Similarities and Differences Among Ongoing Core Metrics Projects													
		Aim				Safety				Other measures of quality			
Sponsoring organization or program	Core metric initiative	<i>Population health</i>	<i>Health care quality</i>	<i>Cost</i>	<i>Patient engagement</i>	<i>Adverse events/errors</i>	<i>Antibiotic prophylaxis</i>	<i>HC-associated infection</i>	<i>Medication review or reconciliation</i>	<i>Access</i>	<i>Preventive & screening services</i>	<i>EHR use</i>	<i>Care transitions/coordination</i> <i>Disparities/equity</i>
CMS	Shared Savings Program (ACO)	X	X	X	X					X	X	X	X
CMS Center for Medicaid	CMS Health Homes Core Measures		X						X		X		X
CMS Center for Medicaid	Medicaid Adult Health Care Quality Measures	X	X		X					X	X		X
CMS Center for Medicaid	Medicaid/CHIP Pediatric Health Care Quality Measures	X	X		X			X	X	X	X		X
CMS/NQF	Evolving Core Measure Set for Dual Eligible Beneficiaries	X	X		X					X	X		X
The Commonwealth Fund	Why Not the Best?	X	X	X						X			X
<i>Consumer Reports</i>	Consumer Reports Health		X	X	X							X	

Summary of Similarities and Differences Among Ongoing Core Metrics Projects														
		Health outcomes and population health			Patient centeredness		Condition focus					Cost and utilization		
Sponsoring organization or program	Core metric initiative	Mortality (outcome or population)	Health factors/risk/behaviors	Current functioning/quality of life	Patient experience/satisfaction	Shared decision making	Diabetes	Cardiovascular conditions	Respiratory conditions	Cancer care	Mental health	Care utilization	Resource use/health care expenditures	Number of measures
CMS	Shared Savings Program (ACO)			X	X	X	X	X	X		X	X		33
CMS Center for Medicaid	CMS Health Homes Core Measures							X			X	X		8
CMS Center for Medicaid	Medicaid Adult Health Care Quality Measures				X	X	X	X	X	X	X	X		26
CMS Center for Medicaid	Medicaid/CHIP Pediatric Health Care Quality Measures				X	X	X		X		X	X		26
CMS/NQF	Evolving Core Measure Set for Dual Eligible Beneficiaries			X	X	X	X		X		X	X		30
The Commonwealth Fund	Why Not the Best?	X	X	X								X	X	42
Consumer Reports	Consumer Reports Health				X	X						X	X	17

Summary of Similarities and Differences Among Ongoing Core Metrics Projects													
		Aim				Safety				Other measures of quality			
Sponsoring organization or program	Core metric initiative	<i>Population health</i>	<i>Health care quality</i>	<i>Cost</i>	<i>Patient engagement</i>	<i>Adverse events/errors</i>	<i>Antibiotic prophylaxis</i>	<i>HC-associated infection</i>	<i>Medication review or reconciliation</i>	<i>Access</i>	<i>Preventive & screening services</i>	<i>EHR use</i>	<i>Care transitions/coordination</i> <i>Disparities/equity</i>
Department of Defense	Military Health Services Strategic Imperatives Scorecard	X	X	X	X	X	X			X	X	X	X
Gretzky Coalition	Gretzky Group	X	X	X	X					X			X
HHS Health People 2020 Project	Leading Health Indicators for Healthy People	X	X							X	X		
HHS in conjunction with the National Priorities Partnership	National Quality Strategy	X	X	X	X			X		X	X		X
HRSA	HRSA Core Clinical Measures	X	X						X	X	X		
IHA	P4P California Core Measure Set	X	X	X	X						X	X	
IHI	Triple Aim Communities	X	X	X	X					X			X X

Summary of Similarities and Differences Among Ongoing Core Metrics Projects													
		Health outcomes and population health			Patient centered-ness		Condition focus						Cost and utilization
Sponsoring organization or program	Core metric initiative	Mortality (outcome or population)	Health factors/risk/behaviors	Current functioning/quality of life	Patient experience/satisfaction	Shared decision making	Diabetes	Cardiovascular conditions	Respiratory conditions	Cancer care	Mental health	Care utilization	Resource use/health care expenditures
Department of Defense	Military Health Services Strategic Imperatives Scorecard		X		X		X	X			X	X	X
Gretzky Coalition	Gretzky Group		X	X	X	X	X	X			X	X	X
HHS Health People 2020 Project	Leading Health Indicators for Healthy People	X	X				X	X		X	X		
HHS in conjunction with the National Priorities Partnership	National Quality Strategy		X			X		X			X	X	X
HRSA	HRSA Core Clinical Measures						X	X		X			
IHA	P4P California Core Measure Set		X		X		X	X	X			X	X
IHI	Triple Aim Communities	X	X	X	X							X	X

Summary of Similarities and Differences Among Ongoing Core Metrics Projects													
		Aim				Safety				Other measures of quality			
Sponsoring organization or program	Core metric initiative	<i>Population health</i>	<i>Health care quality</i>	<i>Cost</i>	<i>Patient engagement</i>	<i>Adverse events/errors</i>	<i>Antibiotic prophylaxis</i>	<i>HC-associated infection</i>	<i>Medication review or reconciliation</i>	<i>Access</i>	<i>Preventive & screening services</i>	<i>EHR use</i>	<i>Care transitions/coordination</i> <i>Disparities/equity</i>
Joint Commission	Joint Commission Accountability Measures		X				X				X		X
Joint Commission	Joint Commission Core Sets		X				X		X		X		X
Leapfrog	Leapfrog Safety Score Methodology		X			X	X	X				X	
Many organizations	CQO Roundtable	X	X	X	X	X		X	X	X			X
NCQA	HEDIS Measures		X	X	X					X	X		X
ONC	Meaningful Use Clinical Quality Measures for Hospitals		X				X		X			X	X
ONC	Meaningful Use Clinical Quality Measures for Physicians		X								X	X	X

Summary of Similarities and Differences Among Ongoing Core Metrics Projects														
		Health outcomes and population health			Patient centeredness		Condition focus					Cost and utilization		
Sponsoring organization or program	Core metric initiative	Mortality (outcome or population)	Health factors/risk/behaviors	Current functioning/quality of life	Patient experience/satisfaction	Shared decision making	Diabetes	Cardiovascular conditions	Respiratory conditions	Cancer care	Mental health	Care utilization	Resource use/health care expenditures	Number of measures
Joint Commission	Joint Commission Accountability Measures							X	X		X			43
Joint Commission	Joint Commission Core Sets							X	X		X	X		11
Leapfrog	Leapfrog Safety Score Methodology													26
Many organizations	CQO Roundtable		X		X							X	X	13
NCQA	HEDIS Measures		X	X	X	X	X	X	X	X	X	X	X	79
ONC	Meaningful Use Clinical Quality Measures for Hospitals							X	X					30
ONC	Meaningful Use Clinical Quality Measures for Physicians						X	X	X	X	X	X		64

Summary of Similarities and Differences Among Ongoing Core Metrics Projects													
		Aim				Safety				Other measures of quality			
Sponsoring organization or program	Core metric initiative	<i>Population health</i>	<i>Health care quality</i>	<i>Cost</i>	<i>Patient engagement</i>	<i>Adverse events/errors</i>	<i>Antibiotic prophylaxis</i>	<i>HC-associated infection</i>	<i>Medication review or reconciliation</i>	<i>Access</i>	<i>Preventive & screening services</i>	<i>EHR use</i>	<i>Care transitions/coordination</i> <i>Disparities/equity</i>
Oregon Health Authority	Coordinated Care Organization Core Measures		X	X	X				X	X	X	X	X
Patient-Centered Medical Home Evaluators Collaborative	Patient-Centered Medical Home		X								X		
Premier	QUEST		X	X	X		X				X		X
State of California	Let's Get Healthy California	X		X				X		X	X		X
State of Massachusetts	Statewide Quality Advisory Committee (SQAC)	X	X		X	X	X		X	X	X		X
State of Minnesota	Statewide Quality Reporting and Measurement System (SQRMS)	X	X			X	X	X		X	X	X	X

Summary of Similarities and Differences Among Ongoing Core Metrics Projects														
		Health outcomes and population health			Patient centeredness		Condition focus					Cost and utilization		
Sponsoring organization or program	Core metric initiative	Mortality (outcome or population)	Health factors/risk/behaviors	Current functioning/quality of life	Patient experience/satisfaction	Shared decision making	Diabetes	Cardiovascular conditions	Respiratory conditions	Cancer care	Mental health	Care utilization	Resource use/health care expenditures	Number of measures
Oregon Health Authority	Coordinated Care Organization Core Measures				X		X	X	X	X	X	X		50
Patient-Centered Medical Home Evaluators Collaborative	Patient-Centered Medical Home						X	X	X	X	X	X		44
Premier	QUEST	X						X	X			X		40
State of California	Let's Get Healthy California	X	X	X			X	X	X		X	X	X	48
State of Massachusetts	Statewide Quality Advisory Committee (SQAC)		X		X		X	X	X	X	X	X		113
State of Minnesota	Statewide Quality Reporting and Measurement System (SQRMS)	X		X	X		X	X	X	X	X			25

Summary of Similarities and Differences Among Ongoing Core Metrics Projects														
		Aim				Safety				Other measures of quality				
Sponsoring organization or program	Core metric initiative	<i>Population health</i>	<i>Health care quality</i>	<i>Cost</i>	<i>Patient engagement</i>	<i>Adverse events/errors</i>	<i>Antibiotic prophylaxis</i>	<i>HC-associated infection</i>	<i>Medication review or reconciliation</i>	<i>Access</i>	<i>Preventive & screening services</i>	<i>EHR use</i>	<i>Care transitions/coordination</i>	<i>Disparities/equity</i>
State of the USA project	State of the USA Health Indicators	X	X	X					X	X	X			
State of Vermont	Vermont ACO Core Measure Set	X	X				X			X	X		X	
United Health Foundation	America's Health Rankings	X	X							X	X			X
University of Wisconsin	County Health Rankings	X	X							X	X			
Veterans Health Administration	Aspire Measures		X		X	X	X	X		X	X		X	X
World Health Organization	Millennium Development Goal Scorecard	X								X	X			X
Totals		25	37	19	21	7	12	9	13	29	32	11	25	8

Summary of Similarities and Differences Among Ongoing Core Metrics Projects															
		Health outcomes and population health			Patient centeredness		Condition focus					Cost and utilization			
Sponsoring organization or program	Core metric initiative	Mortality (outcome or population)	Health factors/risk/behaviors	Current functioning/quality of life	Patient experience/satisfaction	Shared decision making	Diabetes	Cardiovascular conditions	Respiratory conditions	Cancer care	Mental health	Care utilization	Resource use/health care expenditures	Number of measures	
State of the USA project	State of the USA Health Indicators	X	X	X			X	X	X	X	X	X	X	20	
State of Vermont	Vermont ACO Core Measure Set		X			X	X	X	X	X	X			32	
United Health Foundation	America's Health Rankings	X	X	X			X	X		X	X	X		48	
University of Wisconsin	County Health Rankings	X	X	X			X			X	X	X		29	
Veterans Health Administration	Aspire Measures	X			X	X	X	X	X	X		X		68	
World Health Organization	Millennium Development Goal Scorecard	X	X											10	
Totals		14	19	14	19	11	24	28	22	18	27	30	15	1,369	

E

Biosketches of Committee Members and Staff

David Blumenthal, MD, MPP (*Chair*), became president and CEO of The Commonwealth Fund, a national health care philanthropy based in New York City, in January 2013. Previously, he served as chief health information and innovation officer at Partners Health System in Boston, Massachusetts, and was Samuel O. Thier professor of medicine and professor of health care policy at Massachusetts General Hospital/Harvard Medical School. From 2009 to 2011, Dr. Blumenthal was national coordinator for health information technology (HIT) under President Barack Obama. In this role, he was charged with building an interoperable, private, and secure nationwide health information system and supporting the widespread, meaningful use of HIT. As a renowned health services researcher and national authority on health IT adoption, Dr. Blumenthal has authored more than 250 scholarly publications, including seminal studies on the adoption and use of health IT in the United States.

Julie P. W. Bynum, MD, MPH, is associate professor of medicine at the Dartmouth Institute for Health Policy and Clinical Practice of the Geisel School of Medicine at Dartmouth. Dr. Bynum's work focused on assessment of health system performance for the elderly. She has been a Robert Wood Johnson Foundation physician faculty scholar and a National Institute of Aging Beeson scholar (K23), studying the quality and efficiency of health care delivery to high-risk elderly patients. One of Dr. Bynum's contributions to the field was the development of a method for creating "virtual" physician-hospital networks that were used in the conceptual development of the accountable care organization legislation. She continued her policy-relevant

efforts as a health and aging policy fellow. Her active research program includes two National Institutes of Health (NIH)-funded studies: Optimizing Fracture Care Outcomes and Efficiency of Care for High Cost High Need Beneficiaries.

Lori Coyner joined the Oregon Health Authority as director of accountability and quality, overseeing the quality and incentive metrics for Oregon's coordinated care organizations (CCOs). CCOs are the basis for Oregon's health care transformation effort for Medicaid enrollees. Previously, she served as director of measurement and reporting at the Oregon Health Care Quality Corporation. Ms. Coyner is an accomplished biostatistician and was responsible for the development of Quality Corp's quality and utilization reporting system and measure development. Additionally, she has many years of experience working in academic settings at Oregon Health & Sciences University (OHSU) and the University of New Mexico, School of Medicine. She maintains her faculty appointment in the OHSU Department of Public Health and Preventive Medicine, where she teaches Introduction to Biostatistics.

Diana Dooley, JD, was appointed secretary of the California Health and Human Services agency in December 2010 by Governor Jerry Brown. She leads 13 state departments within the agency, chairs Covered California (the Health Benefit Exchange), and serves as chair or member of numerous other boards and commissions. Previously, Ms. Dooley was president and CEO of the California Children's Hospital Association. She began her career as an analyst for the state, and in 1975, she was appointed to the staff of Governor Jerry Brown, for whom she served as legislative director and special assistant until the end of his term in 1983. Before becoming an attorney in 1995, she owned a public relations and advertising agency. Ms. Dooley moved into health care in 2000 when she left her private law practice to serve as general counsel and vice president at Children's Hospital Central California. She received her bachelor's degree from California State University, Fresno in 1972 and her law degree from San Joaquin College of Law in 1995.

Timothy Ferris, MD, MPH, is trained in both internal medicine and pediatrics. He is a practicing primary care physician and senior vice president for population health at Massachusetts General Hospital and Partners HealthCare in Boston. He is also an associate professor at Harvard Medical School and holds degrees from Middlebury College, Oxford University, Harvard Medical School, and the Harvard School of Public Health. His former positions include vice chair of pediatrics at Mass General and medical director of the Mass General Physicians Organization. Dr. Ferris was the principal investigator for a 6-year Medicare demonstration project

that showed both reduced costs and reduced mortality among high-risk Medicare beneficiaries. He now leads the Partners Healthcare pioneer accountable care organization (ACO) and is responsible for the design and implementation of system-wide care delivery changes that will improve patient health, improve the patient experience of health care, and reduce the health care cost burden. Dr. Ferris has more than 90 publications in the areas of health care quality measurement, risk adjustment, population management, and information technology. He has served on multiple committees for the Institute of Medicine (IOM), the Agency for Healthcare Research and Quality (AHRQ), and the National Quality Forum (NQF), where he chaired the Consensus Standards Approval Committee. He has served as a consultant to the Congressional Research Service, the National Governors Association, the World Health Organization, and the Institute for Healthcare Improvement.

Sherry Glied, PhD, became dean of New York University's Robert F. Wagner Graduate School of Public Service in August 2013. From 1989 to 2013, she was professor of health policy and management at Columbia University's Mailman School of Public Health. She was chair of the department from 1998 to 2009. On June 22, 2010, Dr. Glied was confirmed by the U.S. Senate as assistant secretary for planning and evaluation at the U.S. Department of Health and Human Services (HHS), a capacity in which she served from July 2010 through August 2012. She had previously served as senior economist for health care and labor market policy on the President's Council of Economic Advisers, 1992-1993, under Presidents Bush and Clinton, and participated in the Clinton Health Care Task Force. Dr. Glied has been elected to the IOM, the National Academy of Social Insurance, and the board of AcademyHealth, and has been a member of the Congressional Budget Office's Panel of Health Advisers. Her principal areas of research are in health policy reform and mental health care policy. Her book on health care reform, *Chronic Condition*, was published by Harvard University Press in January 1998. Her book with Richard Frank, *Better But Not Well: Mental Health Policy in the U.S. Since 1950*, was published by Johns Hopkins University Press in 2006. She is co-editor, with Peter C. Smith, of *The Oxford Handbook of Health Economics*, which was published by Oxford University Press in 2011. Dr. Glied holds a BA in economics from Yale University, an MA in economics from the University of Toronto, and a PhD in economics from Harvard University.

Larry A. Green, MD, is a family physician, professor of family medicine, and Epperson Zorn Chair for Innovation in Family Medicine and Primary Care at the University of Colorado Denver. His academic career has focused on clinical practice, and on the design of educational, research, and practice

systems and their use to discover and improve the discipline of family medicine and the function known as primary care. He has been a residency program director; an academic department chair; founding director of the Robert Graham Policy Center in Washington, DC; and a member and chair of the National Committee on Health and Vital Statistics. He is currently director of Advancing Care Together, a practice-based initiative focused on learning how to integrate primary care and behavioral health; a member of the board of directors of the American Board of Medical Specialties; and a member of the IOM.

George J. Isham, MD, MS, senior advisor at HealthPartners and senior fellow at the HealthPartners Institute for Education and Research, is responsible for working with the senior management team of HealthPartners on health and quality of care improvement for patients, members, and the community. Prior to his appointment as senior advisor in 2012, Dr. Isham served as HealthPartners' medical director and chief health officer, a position to which he was appointed in 1993. As senior fellow, he is responsible for facilitating progress at the intersection of population health research and public policy. Dr. Isham was a founding board member of the Institute for Clinical Systems Improvement, a collaborative of Twin Cities medical groups and health plans that is improving Triple Aim outcomes and implementing clinical practice guidelines in Minnesota. He currently provides leadership to other care delivery systems through service on the board of directors for Presbyterian Health Services in Albuquerque, New Mexico, and the external advisory board of the Marshfield Clinic in Marshfield, Wisconsin. He currently co-chairs the National Quality Forum-convened Measurement Application Partnership. Dr. Isham chaired the IOM Roundtable on Health Literacy for 9 years and is currently co-chair of the IOM Roundtable on Population Health Improvement. Dr. Isham has served on the IOM's Board on Population Health and Public Health Practice, and chaired the IOM committees that authored the reports *Priority Areas for National Action: Transforming Health Care Quality* and *The State of the USA Health Indicators*. In 2003, Dr. Isham was appointed a lifetime national associate of the National Academy of Sciences in recognition of his contributions to the work of the IOM, to which he was elected as a member in 2014. Prior to his current tenure at HealthPartners, Dr. Isham was medical director for MedCenters Health Plan in Minneapolis and executive director for University Health Care, Inc., in Madison, Wisconsin. His practice experience as a primary care physician included 3 years in the United States Navy; 8 years at the Freeport Clinic in Freeport, Illinois; and 3.5 years as clinical assistant professor in medicine at the University of Wisconsin.

Craig A. Jones, MD, is director of the Vermont Blueprint for Health, a program established by the State of Vermont under the leadership of its governor, legislature, and bipartisan Health Care Reform Commission. The Blueprint is intended to guide statewide transformation of the way health care and health services are delivered for all Vermonters, with a focus on prevention. Dr. Jones has served on several committees and workgroups, including the IOM Committee on the Learning Healthcare System in America and the Roundtable on Value & Science-Driven Health Care. Previously, he was an assistant professor in the Department of Pediatrics at the Keck School of Medicine at the University of Southern California, and director of the Division of Allergy/Immunology and director of the Allergy/Immunology Residency Training Program in the Department of Pediatrics at the Los Angeles County + University of Southern California (LAC+USC) Medical Center. He was director, in charge of design, implementation, and management, of the Breathmobile Program, a program whereby mobile clinics deliver ongoing care to inner city children in their schools and at county clinics. Dr. Jones received his undergraduate degree at the University of California, San Diego, and his MD at the University of Texas Health Science Center in San Antonio, Texas. He completed his internship and residency in pediatrics at LAC+USC Medical Center, where he also completed his fellowship in allergy and clinical immunology.

Robert Kocher, MD, is a partner at Venrock, focusing on health care IT and services investments. He currently serves on the board of Castlight Health and is a board observer at ConsultingMD. He is on the advisory boards of Harvard Medical School's Health Care Policy Department, the University of Southern California's Leonard D. Schaeffer Center for Health Policy and Economics, where he is also a senior fellow; the National Institute of Healthcare Management; and ChildObesity180. He also has been a guest scholar at the Brookings Institution Engleberg Center for Health Reform. He co-founded and for the past 4 years has served as co-chair of the Health Data Initiative, a joint effort of HHS and the IOM focused on the release of health care data to spur private-sector innovation that can improve health care cost and quality. Dr. Kocher also is a member of the Health Affairs Editorial Board. Prior to coming to Venrock, he served in the Obama Administration as special assistant to the president for health care and economic policy on the National Economic Council. In the Obama administration, he was one of the shapers of the Affordable Care Act, focusing on cost, quality, and delivery system reform and health IT policy. He was one of the leaders of the First Lady's "Let's Move" childhood obesity initiative, led the formation of the Partnership for a Healthier America, and served on the federal advisory panel charged with developing a national obesity strategy. Prior to serving in the White House, Dr. Kocher was a partner at McKinsey &

Company, where he led McKinsey Global Institute's health care economics work and the Center for U.S. Health System Reform. He has worked widely across the U.S. health care system to improve regulatory policy, economic performance, labor productivity, clinical outcomes, and patient experience. Dr. Kocher received undergraduate degrees from the University of Washington and a medical degree from the George Washington University. He completed a research fellowship with the Howard Hughes Medical Institute and NIH, and went on to complete his internal medicine residency training at the Beth Israel Deaconess Medical Center and the Harvard Medical School.

Kevin L. Larsen, MD, is medical director of meaningful use at the Office of the National Coordinator for Health Information Technology (ONC). He leads ONC's work on quality policy, measurement, and improvement, including clinical decision support and registries. He serves on a number of HHS and national groups coordinating measure policy and measure sets. Prior to working for the federal government, Dr. Larsen was chief medical informatics officer and associate medical director at Hennepin County Medical Center in Minneapolis, Minnesota. He also is an associate professor of medicine at the University of Minnesota. His research includes health care financing for people living in poverty, computer systems to support clinical decision making, and health literacy. In Minneapolis, Dr. Larsen was also medical director for the Center for Urban Health, a hospital-community collaboration focused on eliminating health disparities.

Elizabeth A. McGlynn, PhD, is director of Kaiser Permanente's Center for Effectiveness and Safety Research (CESR). She is responsible for the strategic direction and scientific oversight of CESR, which is designed to improve the health and well-being of Kaiser's 9 million members and the public by conducting comparative effectiveness and safety research and implementing findings in policy and practice. She is principal investigator for the Kaiser Permanente-led clinical data research network, PORTAL, a Patient-Centered Outcomes Research Institute (PCORI)-funded infrastructure development contract that is part of PCORnet. Dr. McGlynn is an internationally known expert on methods for evaluating the appropriateness, quality, and efficiency of health care delivery. She has conducted research both in the United States and in other countries. She also has led major initiatives to evaluate health reform options under consideration at the federal and state levels. Dr. McGlynn received AcademyHealth's Distinguished Investigator Award in 2012 and is a member of the IOM. She is vice chair of the American Board of Internal Medicine Foundation board of trustees; chairs the National Advisory Council for AHRQ; and serves on the board of AcademyHealth (former chair), the IOM's Board on Health Care Services, and the Reagan-Udall Foundation for the U.S. Food and Drug

Administration (FDA). She also chairs the Scientific Advisory Group for the Institute for Healthcare Improvement, co-chairs the Coordinating Committee for NQF's Measures Application Partnership, serves on the editorial boards for *Health Services Research* and *The Milbank Quarterly*, and is a regular reviewer for many leading journals. Dr. McGlynn received her BA in international political economy from The Colorado College, her MPP from the University of Michigan's Gerald R. Ford School of Public Policy, and her PhD in public policy analysis from the Pardee RAND Graduate School.

Elizabeth Mitchell is president and CEO of the Network for Regional Healthcare Improvement, a national network of 30+ regional health improvement collaboratives. She serves on NQF's board and the Coordinating Committee of NQF's Measure Application Partnership, and chaired the task force developing measures for health insurance exchanges. Ms. Mitchell was CEO of the Maine Health Management Coalition (MHMC), leading public reporting, consumer engagement, and payment reform efforts, and established the MHMC Data and Analytics program, which became the nation's fourth qualified entity. MHMC was named "Implementation Partner" in Maine's State Innovation Model grant. Ms. Mitchell served on the National Business Coalition on Health's board of directors and chaired its Government Affairs Committee. She worked for MaineHealth, Maine's largest integrated health system, leading quality improvement and transparency initiatives. She served two terms in the Maine State Legislature, chairing the Health and Human Services Committee. Ms. Mitchell was a senior policy analyst at the National Academy for State Health Policy and director of public affairs for London's Nuffield Trust. She received an Atlantic Fellowship in Public Policy and completed the International Health Leadership Program at Cambridge University while pursuing graduate studies at the London School of Economics.

Sally Okun, RN, is vice president for advocacy, policy and patient safety at PatientsLikeMe, an online patient-powered research network. She is responsible for bringing patient voice and insight to diverse advocacy and health policy discussions at the national and global levels, and is the company's liaison with government and regulatory agencies. Ms. Okun joined the company in 2008 as manager of health data integrity and patient safety, overseeing the site's medical ontology and the development of the PatientsLikeMe Drug Safety and Pharmacovigilance Platform. She is a member of the PCORI Patient Engagement Advisory Panel; the Scientific Advisory Committee for the Reagan-Udall Foundation's IMEDS program; and numerous expert panels for the IOM, NQF, AHRQ, The Commonwealth Fund, and others. Ms. Okun, a registered nurse and palliative care specialist, received her master's degree from the Heller School for Social

Policy & Management at Brandeis University, was a 2010 fellow in the National Library of Medicine Program in Biomedical Informatics, and a 2014 Salzburg global fellow.

Lyn Paget, MPH, is managing partner of Health Policy Partners, an independent consulting organization dedicated to connecting patient priorities with policy and innovation. Her most recent work involves projects focused on patient-driven quality improvement, patient and physician engagement, patient-reported outcomes, and patient experience measurement for organizations, including the National Committee for Quality Assurance, the Gordon and Betty Moore Foundation, and PatientsLikeMe. Previously, she was director of policy at the Informed Medical Decisions Foundation, where she directed efforts in advocacy, communications, and policy development to support sustainable models of patient-centered care and shared decision making. Ms. Paget was also instrumental in the development and launch of HealthNewsReview.org—a public access website designed to evaluate the accuracy and balance of health and medical news stories. She helped establish and served as vice president of the Medical Outcomes Trust, an organization created to promote the routine use of patient-based outcome measures, including the Short Form (36) Health Survey (SF-36) and other instruments designed to systematically assess health-related quality of life. For several years, Ms. Paget focused on HIV/AIDS prevention, working at the AIDS Project Los Angeles and in Washington State, where she led a combined city-county HIV/AIDS department. Her work in Tacoma received national recognition for innovative approaches to street outreach and education. Ms. Paget holds a BS in health education from the University of Massachusetts and a master's in public health from the University of California, Los Angeles.

Kyu Rhee, MD, MPP, serves as chief health officer and vice president of IBM, where he has direct global responsibilities for all IBM integrated health services strategy, design, and operations. Prior to joining IBM, he was chief public health officer at the Health Resources and Services Administration (HRSA), the primary federal agency for improving access to health care services for people who are uninsured, isolated, or medically vulnerable. While at HRSA, Dr. Rhee served on and led numerous national initiatives related to prevention, quality, and public health. He also served as director of the Office of Innovation and Program Coordination at NIH. While at NIH, he served on and led numerous initiatives related to eliminating health disparities and promoting health equity. Prior to his federal government service, Dr. Rhee worked in community health settings as chief medical officer of Baltimore Medical System Inc., the largest network of federally qualified health centers in Maryland. In addition, he served

5 years as a National Health Service Corps scholar and medical director at Upper Cardozo Health Center, the largest community health center in Washington, DC. During that time, he taught at the George Washington University School of Public Health, where he received a “Best Teacher” award for his class in Community Health Leadership. Dr. Rhee received board certification in both internal medicine and pediatrics. He obtained his medical degree from the University of Southern California, and did his residency and served as chief resident in internal medicine and pediatrics at Cedars-Sinai Medical Center in Los Angeles. He also holds a master’s degree in public policy from the John F. Kennedy School of Government, Harvard University, with a concentration in health care policy. He acquired his bachelor’s degree in molecular biophysics and biochemistry from Yale University, where he also served as president of the student body.

Dana Gelb Safran, ScD, is senior vice president for performance measurement and improvement at Blue Cross Blue Shield of Massachusetts (BCBSMA). In this role, she leads the company’s initiatives to measure and improve health care quality, safety, and outcomes. Dr. Safran also retains an active academic practice as a faculty member in the Department of Medicine at Tufts University School of Medicine, and has authored more than 75 peer-reviewed articles. Prior to joining BCBSMA, she was director of the Health Institute at Tufts Medical Center. She was among the lead developers of the BCBSMA Alternative Quality Contract (AQC), a population-based global budget payment model whose successes in both improving quality and slowing medical spending growth have informed public- and private-sector payment reform initiatives nationwide. Dr. Safran also is recognized as having contributed to the empirical basis for the nation’s push toward a more patient-centered health care system and for developing measures of patient care experience that have been adopted as part of a national standard. She has served extensively in advisory roles for agencies and organizations leading quality measurement and delivery system reform. She currently serves as a member of the American Board of Internal Medicine Council, the board of directors of the Blue Cross Blue Shield Foundation, and the Massachusetts Statewide Quality Advisory Council. She earned her master’s and doctor of science degrees in health policy from the Harvard School of Public Health.

Lewis G. Sandy, MD, is executive vice president, clinical advancement, of the UnitedHealth Group (a Fortune 25 diversified health and well-being company dedicated to helping people live healthier lives). At UnitedHealth Group, he focuses on clinical innovation, payment/delivery reforms to modernize the health care system, and physician collaboration. He also is a principal in the UnitedHealth Center for Health Reform and Modernization, with a focus on payment/delivery innovation and policy. From

2003 to 2007, he was executive vice president and chief medical officer of UnitedHealthcare, UnitedHealth Group's largest business, focusing on the employer/individual health benefits market. From 1997 to 2003, he was executive vice president of the Robert Wood Johnson Foundation (RWJF), where he was responsible for the foundation's program development and management, strategic planning, and administrative operations. Previously, Dr. Sandy was a program vice president of the foundation, focusing on the foundation's workforce, health policy, and chronic care initiatives. An internist and former health center medical director at the Harvard Community Health Plan in Boston, Massachusetts, Dr. Sandy received a BS and an MD from the University of Michigan and an MBA from Stanford University. A former RWJF clinical scholar and clinical fellow in medicine at the University of California, San Francisco, he served his internship and residency at the Beth Israel Hospital in Boston. He is a senior fellow of the University of Minnesota School of Public Health, Department of Health Policy and Management.

David M. Stevens, MD, is research professor in the Department of Health Policy at the Milken Institute School of Public Health at the George Washington University. In addition to his faculty position at the George Washington University, from 2007 to 2014, he also served as director of the Quality Center and associate medical director at the National Association of Community Health Centers. Before assuming his current position at the Milken Institute, Dr. Stevens was senior medical officer for quality improvement in AHRQ and its Center for Quality Improvement and Patient Safety. While at AHRQ, he provided leadership for important initiatives, including an AHRQ/RWJF-sponsored learning collaborative with 9 major national health plans focused on reducing health disparities; a care management improvement project with 17 state Medicaid agencies; a partnership with the Centers for Disease Control and Prevention (CDC) to develop interventions for the prevention of type 2 diabetes mellitus; and an improvement collaborative with end-stage renal disease providers. Before coming to AHRQ, Dr. Stevens served for 15 years as chief medical officer responsible for national clinical leadership of HRSA's Community and Migrant Health Center Program and for leadership of the HRSA/Bureau of Primary Health Care initiative on eliminating health disparities in underserved and minority populations. This landmark program, the Health Disparities Collaborative, transformed preventive and chronic care in health centers and generated major positive clinical outcomes, as documented in the peer-reviewed scientific literature. Dr. Stevens established national quality improvement policies for clinical programs in health centers, including the opportunity for accreditation. With the CDC, he also implemented a major immunization quality improvement initiative, increasing immunization rates by 50 percent

in 9 states in more than 100 health centers, affecting 150,000 underserved infants and children each year. A National Health Service Corps scholar, he was a practicing family physician and medical director for more than 7 years at community health centers in the South Bronx and in Brooklyn, New York. As an officer in the commissioned corps of the U.S. Public Health Service, he has received numerous awards, including the commissioned corps meritorious service medal; the HHS Award for Distinguished Service for contributions to diabetes care; and the Arthur S. Fleming Award, a private-sector award for outstanding federal employees who have made extraordinary contributions to government.

Paul C. Tang, MD, MS, is vice president and chief innovation and technology officer at the Palo Alto Medical Foundation, Sutter Health, and is consulting associate professor of medicine at Stanford University. He directs the David Druker Center for Health Systems Innovation, which focuses on systems-level disruptive innovation to improve the health and well-being of individuals and communities. Dr. Tang has dedicated his professional career to improving the quality of health care in America, using health information technology (HIT) innovatively, empowering patients through HIT, and shaping public policy to enhance health and health care in the United States. He is an elected member of the IOM and has served on numerous IOM study committees, including a patient safety committee he chaired that published two reports: *Patient Safety: Achieving a New Standard for Care* (2004) and *Key Capabilities of an Electronic Health Record System* (2003). Dr. Tang is vice chair of the federal Health Information Technology Policy Committee, and chair of its Advanced Health Models and Meaningful Use workgroup. He has served as board chair for several health informatics professional associations, including the American Medical Informatics Association (AMIA), the Computer-based Patient Record Institute, and the Joint Healthcare Information Technology Alliance. He serves on the board of NQF and chairs its Health Information Technology Advisory Committee. He also serves on the board and executive committee of AcademyHealth. He is a recipient of the AMIA Don E. Detmer Award for Health Policy Contributions in Informatics. Dr. Tang received his BS and MS in electrical engineering from Stanford University and his MD from the University of California, San Francisco. He completed his residency in internal medicine at Stanford University and is a board-certified practicing internist.

Steven M. Teutsch, MD, MPH, is an independent consultant; adjunct professor at the Fielding School of Public Health, University of California, Los Angeles; and senior fellow, Schaeffer Center, University of Southern California. Until 2014 he was chief science officer, Los Angeles County Public Health, where he continued his work on evidence-based public

health and policy. He had been in the Outcomes Research and Management program at Merck since October 1997, where he was responsible for scientific leadership in developing evidence-based clinical management programs, conducting outcomes research studies, and improving outcomes measurement to enhance quality of care. Prior to joining Merck, he was director of the Division of Prevention Research and Analytic Methods at the CDC, where he was responsible for assessing the effectiveness, safety, and cost-effectiveness of disease and injury prevention strategies. He has served as a member of the U.S. Preventive Services Task Force, which develops the *Guide to Clinical Preventive Services*, as well as the American Health Information Community's Personalized Health Care Workgroup and the Evaluation of Genomic Applications in Prevention and Practice Workgroup. He chaired the Secretary's Advisory Committee on Genetics Health and Society; served on and chaired IOM panels, Medicare's Evidence Development and Coverage Advisory Committee; and served on several subcommittees of the Secretary's Advisory Committee on Healthy People 2020. Dr. Teutsch joined the CDC in 1977, being assigned to the Parasitic Diseases Division and working extensively on toxoplasmosis. He was then assigned to the Kidney Donor Program and subsequently the Kidney Disease Program. He developed the framework for the CDC's diabetes control program. He joined the Epidemiology Program Office and became director of the Division of Surveillance and Epidemiology, where he was responsible for coordinating the CDC's disease monitoring activities. He became chief of the Prevention Effectiveness Activity in 1992. Dr. Teutsch received his undergraduate degree in biochemical sciences at Harvard University in 1970, an MPH in epidemiology from the University of North Carolina School of Public Health in 1973, and his MD from Duke University School of Medicine in 1974. He completed his residency training in internal medicine at Pennsylvania State University, Hershey. He was certified by the American Board of Internal Medicine in 1977 and the American Board of Preventive Medicine in 1995, and is a fellow of the American College of Physicians and American College of Preventive Medicine. Dr. Teutsch has published more than 200 articles and 8 books in a broad range of fields in epidemiology, including parasitic diseases, diabetes, technology assessment, health services research, and surveillance.

STUDY STAFF

Elizabeth Malphrus, MPP, study director and associate program officer, received a BA in neuroscience from Columbia University in 2011 and an MPP in science policy from Georgetown University in 2013. Her graduate thesis focused on the role of institutional confidence in predicting public opinion about genetically modified food in the United States. As a graduate student,

she interned at the White House Office of Science and Technology Policy, the American Association for the Advancement of Science, and Amgen Inc. Before beginning her graduate study, she worked as a writer and an editor at the Earth Institute, and ran a volunteer neuroscience teaching program at public schools in the Harlem and Washington Heights neighborhoods of New York City. She has written about science and health policy for numerous professional publications, including *National Civic Review*, *Columbia Journalism Review*, *Science and Technology in Congress*, *Policy Innovations*, and the American Bar Association's *Corporate Social Responsibility Journal*.

Elizabeth Johnston graduated from Georgetown University in May 2012 with a BA in psychology and art history. During her time at Georgetown, she served as a probability and statistics teaching assistant for the Department of Mathematics, as well as an undergraduate admissions student representative. Prior to her work at the IOM, she interned at various institutions in Washington, DC, and Houston, Texas, including the Smithsonian's National Portrait Gallery, FotoFest International, and Hart Energy Publications, to expand her interests in writing and communications. In fall 2015, she will be joining the University of Virginia Law class of 2018, with an intent to specialize in intellectual property law.

J. Michael McGinnis, MD, MA, MPP, is Senior Scholar at the National Academy of Medicine (NAM), where he is also an elected NAM Member and founder of its Learning Health System initiative. He served through four U.S. administrations (Carter, Reagan, Bush, Clinton) with leadership responsibility for disease prevention and health promotion policy, and was founder and steward of various still ongoing national programs and policies, including the *Healthy People* program of national goals and objectives, the HHS/U.S. Department of Agriculture *Dietary Guidelines for Americans*, the U.S. Preventive Services Task Force, and the Ten Essential Services of Public Health. He was also former founding director/chair of the Health Group at RWJF; the World Bank/European Commission Task Force for Health Reconstruction in Bosnia; the federal Office of Research Integrity (HHS), and the HHS Nutrition Policy Board. In prior service, he served as director of the World Health Organization smallpox eradication program in Uttar Pradesh, India, and director of the U.S.–Eastern Europe cooperative health research program. He is best known for his research and publications on the basic determinants of health status. He was educated at Berkeley (BA); University of California, Los Angeles (MA, MD); and Harvard's Kennedy School of Government (MPP).

